Smithsonian

June 1996

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At the National Zoo, a new 'Think Tank' for orangutans (p. 32)

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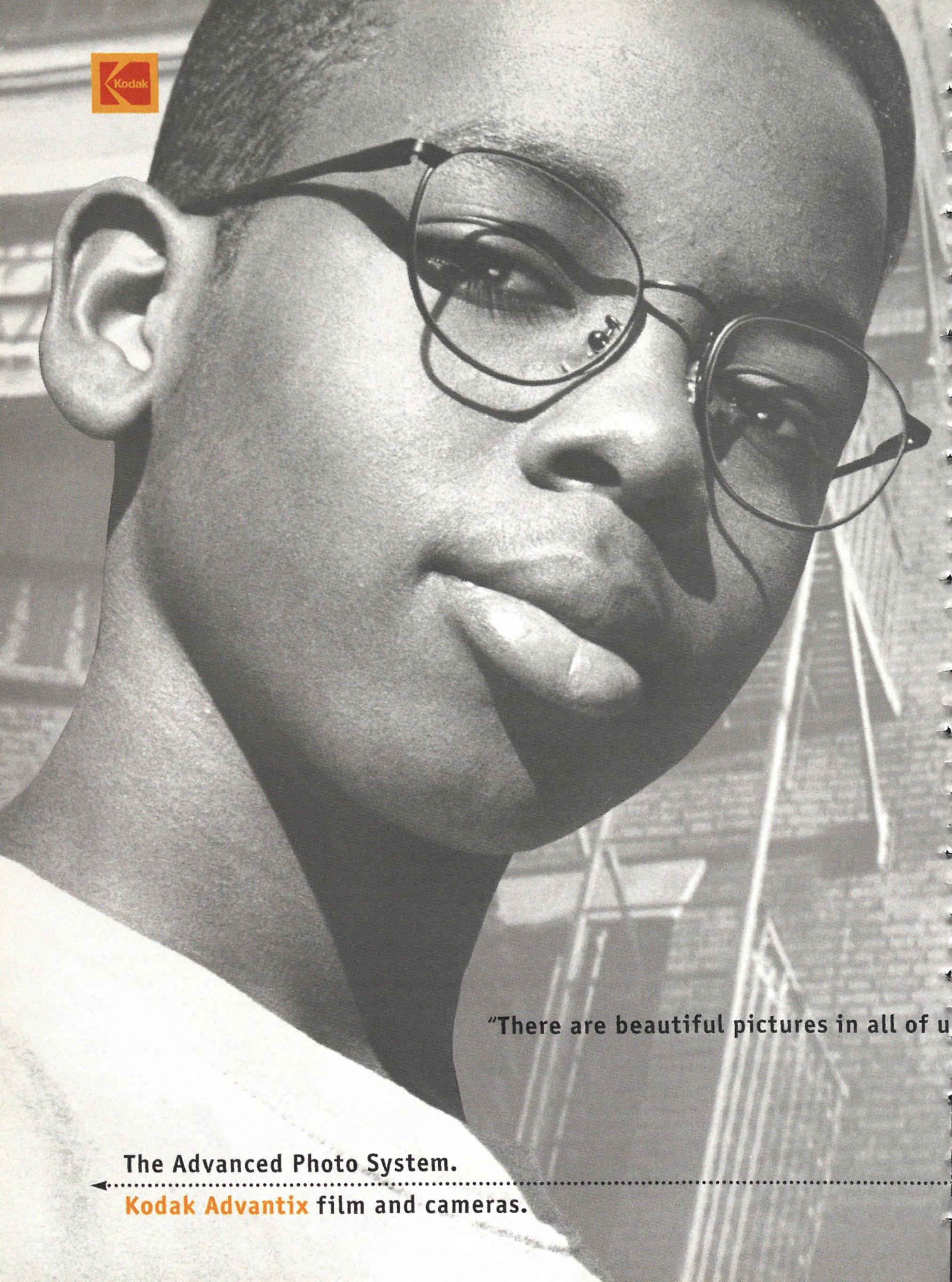

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Smithsonian *departments*

June 1996
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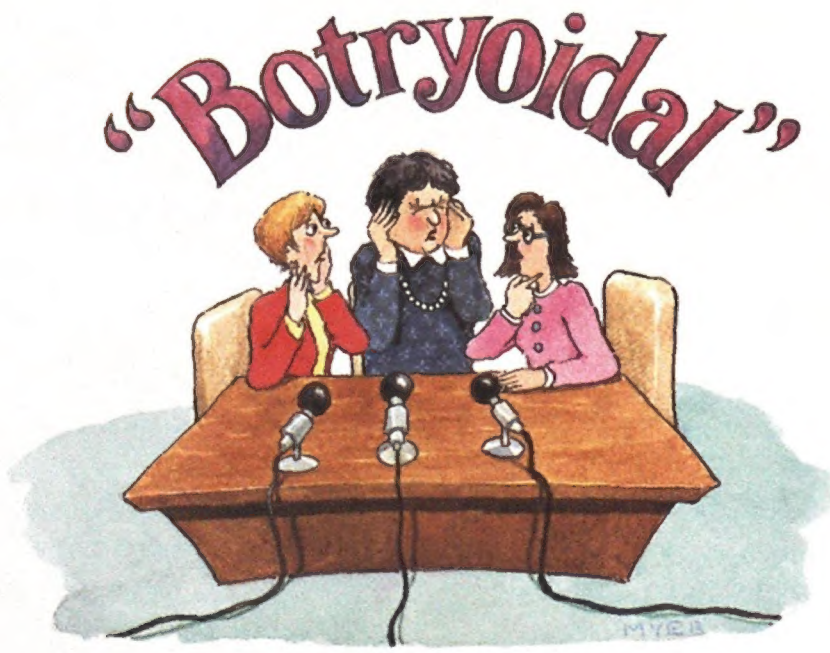

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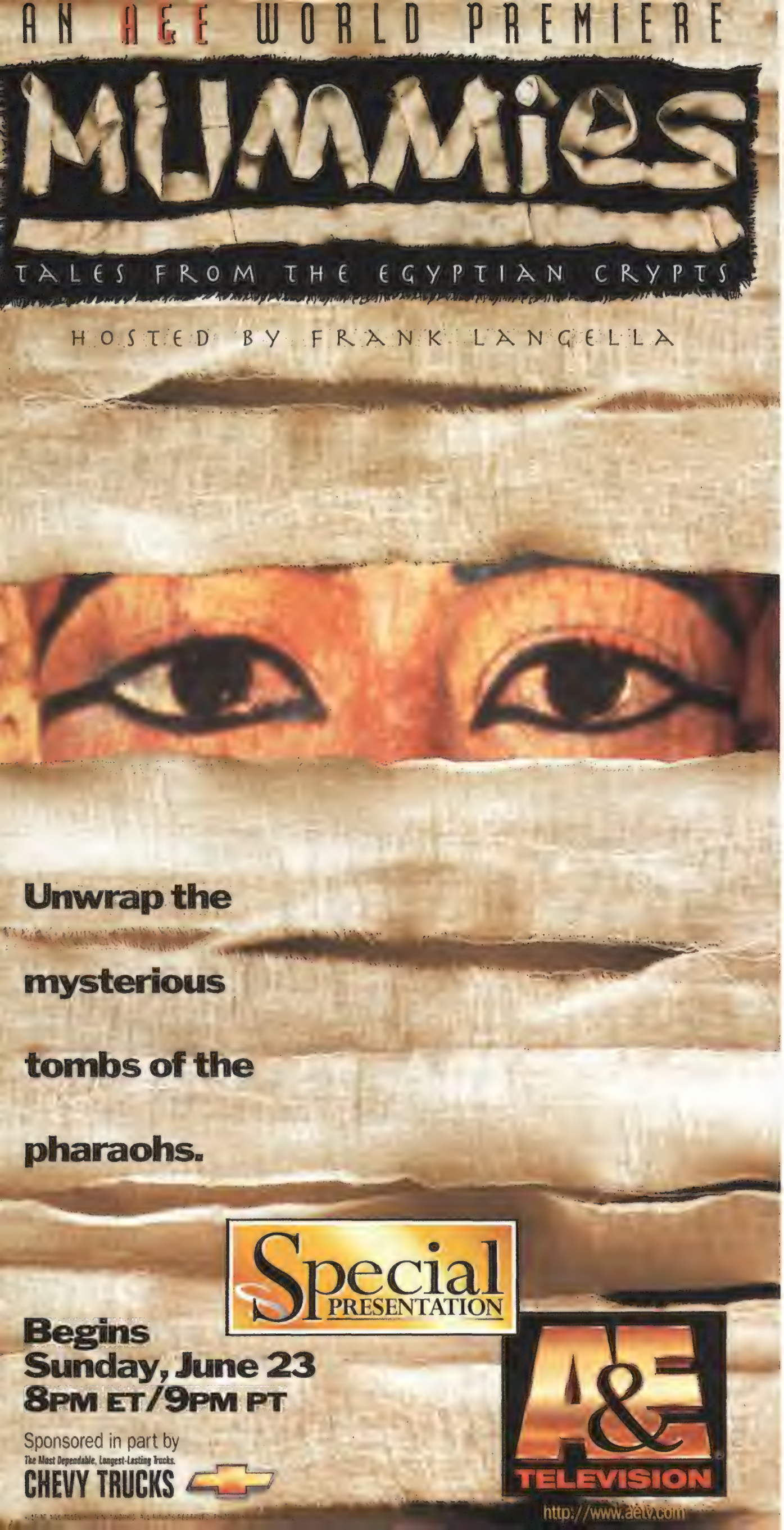

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Secretary Heyman's comments

Smithsonian Perspectives

In its early days, the Smithsonian faced the Civil War, a disastrous fire and a vastly uncertain future

One of my predecessors as Secretary of the Smithsonian, S. Dillon Ripley, titled this column "The view from the castle." I understand why he did. Looking out from the Smithsonian Castle in the middle of the National Mall, one has a bird's-eye view of much of the pageant of American history as it has unfolded in our nation's capital.

There were times, of course, when the Smithsonian's location put it a little too close to the events of the day. Perhaps no greater example of this was the era of the Civil War, when the Smithsonian shared the nation's agony and the capital's vulnerability. And the Smithsonian was not just vulnerable in a physical sense. It had been launched in 1846, not quite 15 years before the start of hostilities, and it had only begun to fully enjoy its first building, the Castle, completed in 1855. By no means did it feel secure as an established institution in the national life.

Although the Smithsonian had not taken a position on the great issues of the day, slavery and union, Secretary Joseph Henry's friendship with Jefferson Davis, leader of the Confederacy, led to suspicions about Henry's loyalty to the Union. Davis was a former Regent and an enthusiastic supporter of the Smithsonian during the 1850s.

Early in the war, Henry ran into added difficulties because of the abolition lectures held at the Smithsonian. Educational and philanthropic groups traditionally had been allowed to use its lecture hall providing they did not discuss religious or political matters. Despite its agreement to these rules, the Washington Lecture Association used the hall for a series of lectures that turned into an abolitionist forum. Among the speakers were the newspaper editor Horace Greeley, Henry Ward Beecher and Wendell Phillips. Henry was criticized both for allowing the lectures to continue and for disavowing Smithsonian responsibility for them.

Ultimately, there was no question but that the Smithsonian would share the fate of the Union cause. James Conaway, in his fascinating book commemorating the Smithsonian's 150 years of history, notes that within a week of the fall of Fort Sumter, Spencer Baird, who was then Assistant Secretary, "prepared for a possible Confederate assault on the city by packing away rare eggs and birds."

The usefulness of the Smithsonian to the war effort was pondered by some in the federal government. One proposal, never accepted, would have converted the Castle to a war infirmary. That is, in fact, what temporarily happened to the United States Patent Office Building, now the site of the National Portrait Gallery and the National Museum of American Art.

That beautiful building, which predated the Castle by a few years, housed within its walls Clara Barton, an outstanding war nurse who later founded the American Red Cross, and Walt Whitman, who saw temporary service as a nurse to injured Federal troops treated in the Patent Office Building during the first months of the war. The building's Great Hall and what we now call the Lincoln Gallery would also serve as the site of Lincoln's second Inaugural ball.

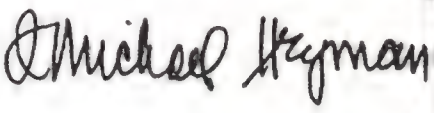
Although the Smithsonian was never taken over for war purposes, it did make itself useful throughout the war. One of Secretary Henry's more dramatic contributions to the Union cause was his introducing President Lincoln to the balloonist Thaddeus S.C. Lowe, whose ideas on the military uses of balloons for the observation of Confederate troop movements would contribute to the creation of the Union's Aeronautic Corps. Henry himself served on the U.S. Navy's Permanent Commission, evaluating inventions for their potential military usefulness.

Lincoln was an occasional visitor to the Castle, enjoying the diversion of watching Secretary Henry and his colleagues test signaling devices, and Henry sometimes called on him at the White House. On one occasion, the two were confronted by a man wishing to report lights shining at midnight from one of the Castle towers. He was convinced that these were signals to the Rebels by Secretary Henry, who he felt was clearly a Confederate sympathizer. Lincoln then introduced the caller to Henry, who explained that the lights were lanterns for reading meteorological instruments on the tower. Lincoln could not restrain his laughter at the look of dismay on the visitor's face.

Other Smithsonian work went on, enlivened during the middle of the Civil War by a group of young and occasionally rowdy scientists who resided in the Castle while pursuing research in natural history. But the uncertainties and requirements of wartime dominated the Smithsonian mood.

With the ending of the Civil War, the Smithsonian faced an unrelated catastrophe. In January of 1865, a fire broke out, collapsing the central roof of the Castle and destroying the second floor. Lost in the flames were most of the papers of the founder, James Smithson, many of Secretary Henry's files, and the priceless collections of portraits of Native Americans by Charles Bird King and John Mix Stanley.

After the shaky circumstances of its creation, the trials of war and the devastation of fire, the Smithsonian faced the country's postwar future. We who can look back at the Institution's subsequent growth take pride in what the nation and the Smithsonian would soon accomplish. But how uncertain it all must have seemed in 1865.



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Letters to the Editor

ANWR

Regarding Jim Doherty's March article on the Arctic National Wildlife Refuge: I literally ate it up. As I read, I virtually saw myself in that beautiful, pristine and wild place. I do not want anything done to its land, water or sky that is not au naturel. God lives there.
Jennifer Peoples
Dover, New Hampshire

Jim Doherty clearly shows his elitism by proudly explaining how proponents of preserving the Arctic Wildlife Refuge got around the wishes of the majority of Alaskans. With the world population exploding, people have got to have resources for living. Seldom is over-population—the root cause of habitat destruction—addressed, and unless it is controlled, planet Earth is going to be overloaded. In the meantime, we have to make do.
James H. Lacey jr.
Canton, Mississippi

The Arctic Refuge is all that remains of America's once unspoiled wilderness, and it is a living museum well worth complete protection from any and all forms of development. Taking away bits and pieces of this fragile ecosystem would have devastating effects. Imagine government officials and businessmen strolling into the Smithsonian and removing a quarter of the exhibits for a private sale, and you can begin to imagine our deep concerns.
Samuel Mix and *Kristin Roger*
Nondalton, Alaska

Small foundations

I was delighted to see that the fine article by Edwin Kiester on family foundations was built around the Stocker Foundation. In 1949 my family immigrated to the United States from Hungary. During World War II, my father had been active in the non-Communist underground, which fought against the Nazis. After the war the Russians arrested him as a "nationalist" who would, no doubt, oppose their occupation. After his mistaken release, he, my mother, my two brothers and I, age 4, fled by foot to Austria where we waited for one year for passage to America. We could not go without a sponsor, but who would take a penniless family of five? Paul and Beth Stocker did. We lived with them and their three daughters in their Lorain, Ohio, home until we could care for ourselves. The Stockers, their children and grandchildren represent the very best America has to offer. I try to live my life by their example.
Gyongy Laky, Chair
Department of Art
University of California, Davis

Fabergé cigarette cases

Admirers of Luzarche d'Azay's cigarette cases, and romantics in general, may like to know that the Arabic inscription on several of them says "Cécile," the name of the French princess he loved.
Thomas Codogan
Embassy of the United States
of America
Jakarta, Indonesia

Hippopotamuses

David M. Schwartz's excellent article on hippos correctly noted that my immunological work has shown whales to be more closely related to hippos than to other artiodactyls but that DNA studies had failed to confirm this finding. While SMITHSONIAN was on press, an article by Ulfur Arnason and Anette Gullberg (*Molecular Biology and Evolution*, February 1996) confirmed the hippo-cetacean connection through DNA. Arnason and Gullberg compared the cytochrome b sequences of a large number of whales, dolphins and other artiodactyls, and generated a family tree showing the cetaceans to be most closely related to the hippopotamus.
Jerold M. Lowenstein, M.D.
Clinical Professor of Medicine
University of California, San Francisco

Ataturk

I enjoyed Eric Lawlor's article on Kemal Ataturk, having grown up in Turkey during the revolutionary period. Ataturk's banning of the fez was an act to abolish religious factions with exclusionary practices. It was a time when divergent Muslim sects identified their members by certain colors and styles of headgear, mostly turbans. The Ottomans brought the fez from Algeria and imposed it on the Turks in the 18th century, and the Muslim clergy, ironically, resisted the idea with bloody revolts.

The fez revolution also included the banning of veils and the black garb worn by women, which was another milestone for women's liberation.
Ali N. Baser
Leawood, Kansas

Choctaws

Thank you for Fergus M. Bordewich's informative article on the success of the Choctaw Nation. The Choctaws were one of three groups (also Jews and Quakers) that organized relief efforts for Ireland during the potato famine. They sent their entire treasury: $170.
Jane Rix
Chicago, Illinois

On page 74 you incorrectly stated that the Crees along with the Cherokees, Chickasaws, Seminoles and Choctaws "became known collectively as the 'Five Civilized Tribes.'" The reference should have been to the Creeks, the anglicized name for the Muskogee Nation of which I am a proud member. They were neighbors of the Choctaws, living in Alabama and Georgia, but were removed by force in the 1830s.

Today the Creek Nation is headquartered in Okmulgee, Oklahoma, where it is moving in directions similar to those undertaken by the Choctaws.
Ian M. Campbell
Edwards, Missouri
We also erred by placing the Jicarillas in Arizona instead of New Mexico. Ed.

Unless they do things differently on the reservation in Mississippi than we did

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on the farm in Alabama, Choctaw Chief Phillip Martin never "chopped cotton for 50 cents per 100 pounds." Chopping cotton is an activity performed with a hoe to dig up weeds—usually Johnson grass and cockleburs—and to thin, or space out, the plants. We were paid by the hour or by the day for chopping cotton. We were paid by the pound to pick it.

That small detail aside, thank you for an enlightening and inspiring story. It proves you don't have to stay down just because you have been put down.
Cleo M. Brooks
Dalton, Georgia

1846

In the April issue, the article "1846 The way we were—and the way we went," by Timothy Foote, was extremely interesting. We tend to forget such important chapters in history. One footnote to the story is that not every member of Congress accepted President James K. Polk's explanations for the war with Mexico. One dissenter was Illinois Congressman Abraham Lincoln, who insisted that the war had been "unnecessarily and unconstitutionally commenced by the President." In a series of "spot resolutions," Lincoln demanded to know if the so-called spot on which American blood had been shed was actually owned by the United States.
Frank Lorey
San Diego, California

I often hear people condemning our nation: the elderly complain about what it has become; teenagers despair of the America they'll inherit. Timothy Foote's article gave me hope. Perhaps future generations will find the pioneers' pride and patriotism in their souls and take back the streets of our cities.
Bonnie Anne Wilmot
Lincoln, Nebraska

Softball

I generally enjoy every article in your fine magazine, but I was disappointed with the uncharacteristically poor caption for the closing picture in Bil Gilbert's article on softball. Despite the comment in the text regarding the all-girl Fairfield Flames ("their usual off-the-field topic, boys"), I thought it was demeaning and frivolous to suggest that these young women who finished their season 13-1 might be sitting in the dugout talking about boys. It is unlikely a similar caption would have been written about young men.
Mary L. White
Baton Rouge, Louisiana
When asked to comment, Amanda Gilbert said, "Ever since the second grade, girls on my teams have talked about boys. They talk about us. Why shouldn't we talk about them?" Bil Gilbert says Amanda's observations are the same as his after having coached several hundred boys and girls. Ed.

My ultimate softball experience occurred on the Washington Mall in 1990. Our informal, unreserved field was on a direct line between the White House and the Jefferson Memorial on one axis, and the Washington Monument and the Lincoln Memorial on the other. The weather was ideal, and the sun was setting over the Potomac River. Near the Reflecting Pool the military was practicing its welcoming ceremony for then-Soviet President Mikhail Gorbachev's second visit to the United States. Our National Wildlife Federation "Wild Things" were trailing in the last inning. Mark Haveman, our coach and star player, slammed the winning homerun and started to round the bases just as the helicopters took off and the 21-gun salute commenced.

It doesn't get much better than that.
Glenn P. Sugameli
Arlington, Virginia

Highlights Continued

In the "Highlights" column about the 1996 Smithsonian Craft Show I spotted the rug by Mary Zicafoose that is titled "La Iguana y La Escalera Roja." Regrettably, you credited it to another artist. The rug is made of hand-dyed and woven wool on linen.
Rosalie Sherman
Gulph Mills, Pennsylvania

Scorpions

What a surprise I had upon taking my dress shoes out of a plastic bag and finding a lethargic scorpion perched on top. My genetically programmed instinct kicked in and I promptly stepped on it. The last time I'd worn the shoes was to an evening garden party in Jerusalem. That scorpion had traveled in my suitcase from the Holy Land via ferry and train to Paris, and even made it through customs in New York.
Jessie Lang
Kearny, New Jersey

English Channel swimmers

Being the first woman to swim the English Channel was not Gertrude Ederle's only achievement: she also took home three medals from the 1924 Olympic Games in Paris. Ederle suffered severe hearing loss from spending so much time in cold waters and later in life taught deaf children how to swim.
Robert L. Austin
Denver, Colorado

Your article omitted two English Channel swimmers of note: Americans Ted Erickson and his son Jon. Ted made headlines for his double crossing (England-France-England) on September 19-21, 1965, in 30 hours, 3 minutes. He held the record for ten years until Jon broke it in 30 hours even. In 1981, Jon became the first person to complete a triple crossing, in 38 hours, 27 minutes.

Ted, who has trained five successful Channel swimmers, continues to swim with Umbra, his dog. Umbra the Wonder Dog is on file with the *Guinness Book of World Records* for her own time and distance swimming. On July 22, 1995, she became the first canine to cross the Bosporus (Asia to Europe), in 31 minutes.
Diane Richards
Chicago, Illinois

Transmit mail for consideration in this column to edletters@aol.com or post it to Letters Editor, SMITHSONIAN, *900 Jefferson Drive, MRC 406, Washington, DC 20560. You must include your full name, telephone number and postal address.*

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Phenomena, Comment and Notes

By John P. Wiley jr.

Looking at the Smithsonian from the inside: a 'random sample' of anthropologists, biologists and geologists explain why they consider it an inimitable place to work

Before you can talk about anything, you have to know what it is; you must be able to define it. For a column marking our parent institution's 150th anniversary, I was going to have a go at defining the place myself. But then it occurred to me: Who better to do this than some of the 6,500 men and women who work here? So I picked out a baker's dozen and challenged them to come up with a definition in one sentence or at most one paragraph, but no more. "What to you," the question read, "is the essence of the Smithsonian?"

The sample is totally unscientific. We could not encompass the whole Smithsonian in one issue last month, and it certainly cannot be done in one column. So I talked only to people in the National Museum of Natural History, the National Zoological Park and the Smithsonian Environmental Research Center. These are biologists, anthropologists and geologists, people I've met over the years who I thought would have something to say. They did.

Here, for example, is George Zug, a curator of reptiles and amphibians at Natural History. He e-mailed his reply as he left for the field: "For me [the essence] is the opportunity to satisfy the curiosity in our souls. This applies equally to someone visiting our exhibits and to my own search for unknowns in the biology of sea turtles or the relationship of two gecko species in the South Pacific."

Gene Morton is a research ornithologist at the National Zoological Park. He put it this way: "Above all, the Smithsonian creates one great empirical theory of the way life adapts to Earth through the natural history knowledge its scientists create and pass on."

Fish and shark expert Victor Springer, a curator at the Natural History museum, took a few extra words: "When the American people think of the Smithsonian, they think MUSEUM—a good show. As a kid I dreamt of the day I could visit the Smithsonian and see the displays of the great variety of life past and present. What I, and the public, did not think about were the scientist-scholars whose curiosity drove them to collect all those things in the show, to study those things in order to give them meaning, and to impart that meaning by publishing and bringing into being the exhibits that so attract not only their fellow Americans but people from all over the world."

Dennis Stanford (below), an anthropologist who heads up the Paleoindian/Paleoecology Project, says he has found the best possible place to work. "Anthropology in the United States had its earliest beginnings at the Smithsonian. This is the center for paleoindian research, and has been since Day One. Today our department is a crossroads for hundreds of scholars. Talking to all these people, I gain firsthand knowl-

Devra Kleiman of the National Zoo records golden lion tamarins in Brazil, left. Anthropologist Dennis Stanford relaxes after a long day's dig in Colorado.

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edge of what is going on all over the Western Hemisphere. It's the perfect place for synthesis."

Don Ortner is an anthropologist who studies human adaptation and disease in ancient peoples. He has just finished a two-year stint as acting director of the National Museum of Natural History. "I fell in love with the place at age 13. Looking at specimen labels inside all those dark cherry cabinets, I would take pages of notes, never thinking I'd be on the staff some day," he says.

"It's a place where you can ask, What are the really important scientific problems? and then work on them. It is vital for great nations to have such places. I think curiosity is genetic. Our ancestors wanted to understand natural phenomena—for example, What are the stars? It is just as important for scientists today to pursue the important questions of our time and share this knowledge with others."

Stan Shetler is a botanist and former deputy director of the museum who also has filled in as acting director. He explains that the Smithsonian is "a citadel of learning where scholars pursue basic answers to questions of natural heritage and human existence." It is also, he says, "the national keeper and interpreter of the material record of the American odyssey, its explorations, discoveries, and scientific, technological and cultural achievements."

Asked about our place in biology, he says, "We are the only national institution devoted to the discovery and elucidation of biodiversity across a broad range of plant and animal groups, not just in North America, but around the globe. Our role in the broad sense has been as the nation's keepers of the catalog of nature, and we are unique in the depth and breadth of both our collections and our expertise."

Jonathan Coddington, a spider researcher and chairman of the entomology department (and the spokesman for taxonomy in the May issue): "The Institution's natural history collections are the biological, geological and anthropological 'reference library' for the nation. The greatest diversity of species on Earth is here at Natural History. There are, for example, more beetles and flies per square foot in our entomology collections than in any tropical forest anywhere on Earth, bar none."

Dick Fiske is a volcanologist and former director of the Natural History museum. "The Smithsonian is the keeper of our national—and natural—heritage. It is regarded by the American people as a citadel on a hill. We have to try to live up to that reputation: our job is to keep doing good things."

Zoologist John Seidensticker wants the public to gain a new perspective.

Senior scientist Dave Pawson, who studies sea urchins and sea cucumbers around the world, was specific: "From my laboratory, where I am studying sea urchins found in the deep ocean around the Bahama Islands, I can walk a few steps to the collections and find the same species, some collected 120 years ago! I can dissect the stomachs of specimens in the collections to study feeding preferences and learn that year-round this species feeds exclusively on turtle grass dislodged from shallow water by storm waves. And the turtle grass beds are disappearing."

Devra Kleiman (p. 20) is the assistant director for research at the National Zoo. She says: "The [Institution] traditionally supports long-term, multi-disciplinary research. Smithsonian scientists can therefore pursue research questions that may require decades to answer and may be critical to the development of new models, new disciplines and revolutionary approaches to old issues. I doubt that I could have developed the multi-zoo, multi-institution, multi-national, multi-disciplinary program for the conservation of the golden lion tamarin [a small, spectacular monkey that had been on the verge of extinction in the wild] and its habitat in Brazil, which has become a model for international conservation programs, without the solid support base provided by the Smithsonian and the National Zoological Park."

Lisa Stevens is a curator who specializes in primates and giant pandas. "The essence of the Smithsonian is captured for me," Stevens says, "when a visitor is engaged and enthralled by viewing a collection object. At the Zoo these objects are living ambassadors of endangered species. I recall and reexperience this excitement daily, through the visitors' eyes."

Katherine Ralls, a research zoologist, delineated the impact of the Zoo: "This environment has enabled me to contribute to the welfare of endangered or threatened species, including southern sea otters, Hawaiian monk seals, San Joaquin kit foxes and California condors."

Zoo curator John Seidensticker (left) has devoted his life to the big cats of the world, especially tigers and mountain lions. Here is his take on the Smithsonian: "I keep relating to something that happened 20 years ago. My mother grew up in Whitehall, Montana, where her father was a railroad section foreman. When she first came to Washington 20 years ago, she went to see the steam locomotive at what is now the National Museum of American History. The sight of it, and the soundtrack that was played, brought tears to her eyes. That's powerful. The message is really in the experience.

"What I do is try to use this little space here we call a zoo to help visitors gain perspective on the world and our place in it. I want them to take a hard look at the animals, to see them, to ask questions, until the animals become theirs. Once that happens, they will not allow these animals to become extinct."

Jim Lynch is an ecologist at the Smithsonian Environmental Research Center in Edgewater, Maryland. He works there and in the Yucatán, Australia and Kenya, learning what happens to birds when the habitats they depend on are disturbed by hurricanes, wildfires or clearing for agriculture. He takes an overall view: "To me, the Smithsonian embodies the richness of human history, culture and science. Its unique strengths are its independence, inclusiveness, continuity, devotion to excellence and, of course, its staggering magnitude. What a place to work!"

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Book Reviews

High Tide in Tucson
Barbara Kingsolver
HarperCollins, $22

Barbara Kingsolver's essays are like conversations across a metaphoric fence, the fence that always divides a reader from a favorite novelist. In her novels, Kingsolver has the advantage of inventing characters and stories you can love or hate, but who are just so; you would not think of arguing with them. In this wide-ranging collection of essays, however, she is speaking of, and for, herself and revealing the kinds of details, stories and opinions that make you want to talk back like a neighbor.

It's an illusion, of course: there are moments when Kingsolver reminds you that she's the writer, you're the reader, and there's no fence. One essay begins this way: "Maybe this has happened to you: You are curled up on the sofa, with an afghan maybe, and the person you love is there too. You are female, because, I'm sorry, but I have the typewriter and you have to be what I say."

This particular essay is based on a "Last Page" for SMITHSONIAN (June 1990), which I, one of the magazine's editors at the time, encouraged her to write—for which the author thanks me in the book's preface. Having been her editor, I confess, was a pleasure. Being her reader now is no less so. Much of Kingsolver's writing is transparent; it flows by with as little turbulence as a clear stream. But there is nothing artless about it, and the literary mind at work becomes visible now and then in the sudden splash of a figure of speech.

Describing her attitude toward housework, for example, she remarks, "Cleanliness is next to godliness only if you're God's Wife." And reflecting on her mother's generation, whose domesticity was far more developed than her own, she writes: "If you work in the kitchen and have the mind of a rocket scientist, you're going to organize your cupboards like Mission Control. Nobody will know their way around it as well as you do. It needs to be that way. The gift of a microwave is an insult, if it suggests you could be replaced by the twist of a knob and a loud ding."

Sometimes Kingsolver's language breaks the surface of the stream like a leaping fish, in a long and graceful arc of analogy or simile. "I have been gone from Kentucky a long time," she writes. "Twenty years have done to my hill accent what the washing machine does to my jeans: taken out the color and starch, so gradually that I never marked the loss." And in describing her own passion for the "curious risk" of writing fiction, she gives the language claws and teeth: "The part of my soul that is driven to make stories is a fierce thing, like a ferret: long, sleek, incapable of sleep, it digs and bites through all I know of the world."

There is a kind of ferocity in her descriptions of nature that makes them unforgettable, as when she writes of the sudden storms that break the intense heat and drought of the Arizona desert where she lives: "We revel in our misery only because we know the end, when it comes, is so good. One day there will be a crackling, clean, creosote smell in the air and the ground will be charged and the hair on your arms will stand on end and then BOOM, you are thrillingly drenched. All the desert toads crawl out of their burrows, swell out their throats, and scream for sex while the puddles last. The ocotillos leaf out before your eyes, like a nature show on fast forward. There is so little time before the water sizzles back to thin air again. So little time to live a whole life in the desert. This is elemental mortality, the root of all passion."

And, in a sense, this is what all of Kingsolver's writing is really about; whether she is writing about her 2-year-old daughter's acts of defiance, about buying a love fetish in a West African street market, or about the wild pigs that chew up her desert garden at night, she is searching, always, after "the root of all passion."

For Kingsolver, this is always found in relationships, whether in the ecologies of a desert, or a single-parent family, or a community of different cultures. Her writing is both personal and political; yet, with a novelist's eye for the complexity of things, she avoids the traps of self-indulgence and polemics. Throughout these essays there is an undercurrent of humor, which sometimes becomes the stream itself. "Confessions of a Reluctant Rock Goddess," her account of a brief stint as a keyboard player in a band of best-selling authors, including Stephen King (rhythm guitar) and Amy Tan (vocals), is a classic footnote to our literary history.

In an essay on the art of fiction writing, Kingsolver offers this comic insight into the roots of her own irresistible passion for storytelling: "When I got old enough to use public transportation by myself, my sport was to entertain other passengers with melodramatic personal histories that occurred to me on the spot. I was a nineteen-year-old cello virtuoso running away from my dreadful seventy-year-old husband; or I had a brain tumor, and was determined to see every state in the union by Greyhound in the remaining two months of my life; or I was a French anthropologist working with a team that had just uncovered the real cradle of human origins in a surprising but as-yet-undisclosable location. Oh how my fellow passengers' eyes would light up. People two rows ahead of me would put down their paperbacks, sling an elbow over the back of the seat, and ride all the rest of the way to Indianapolis backward, asking questions."

This book of essays is a work of nonfiction, but reading Kingsolver is still a wild ride.

Reviewer *Paul Trachtman* writes from his home in rural New Mexico.

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Brief Summary
ZYRTEC™ (cetirizine hydrochloride) Tablets For Oral Use (FOR FULL PRESCRIBING INFORMATION, CONSULT PACKAGE INSERT) **CONTRAINDICATIONS** ZYRTEC is contraindicated in those patients with a known hypersensitivity to it or any of its ingredients or hydroxyzine. **PRECAUTIONS** Activities Requiring Mental Alertness: In clinical trials, the occurrence of somnolence has been reported in some patients taking ZYRTEC; due caution should therefore be exercised when driving a car or operating potentially dangerous machinery. Concurrent use of ZYRTEC with alcohol or other CNS depressants should be avoided because additional reductions in alertness and additional impairment of CNS performance may occur. **Drug-drug interactions:** No clinically significant drug interactions have been found with theophylline at a low dose, azithromycin, pseudoephedrine, ketoconazole, or erythromycin. There was a small decrease in the clearance of cetirizine caused by a 400 mg dose of theophylline; it is possible that larger theophylline doses could have a greater effect. **Carcinogenesis, Mutagenesis and Impairment of Fertility:** No evidence of carcinogenicity was observed in a 2-year carcinogenicity study in rats at dietary doses up to 20 mg/kg/day (15 times the maximum recommended human dose on a mg/m^2/day basis). An increased incidence of benign liver tumors was found in a 2-year carcinogenicity study in male mice at a dietary dose of 16 mg/kg/day (6 times the maximum recommended human dose on a mg/m^2/day basis). The clinical significance of these findings during long-term use of ZYRTEC is not known. Cetirizine was not mutagenic in the Ames test, and not clastogenic in the human lymphocyte assay, the mouse lymphoma assay, and the *in vivo* micronucleus test in rats. No impairment of fertility was found in a fertility and general reproductive performance study in mice at a dose of 64 mg/kg/day (26 times the maximum recommended human dose on a mg/m^2/day basis). **Pregnancy Category B:** Cetirizine was not teratogenic in mice, rats and rabbits at doses up to 96, 225, and 135 mg/kg/day (or 40, 180, and 216 times the maximum recommended human dose on a mg/m^2/day basis), respectively. There are no adequate and well-controlled studies in pregnant women. Because animal studies are not always predictive of human response, ZYRTEC should be used in pregnancy only if clearly needed. **Nursing Mothers:** Retarded pup weight gain was found in mice during lactation when dams were given cetirizine at 96 mg/kg/day (40 times the maximum recommended human dose on a mg/m^2/day basis). Studies in beagle dogs indicate that approximately 3% of the dose is excreted in milk. Cetirizine has been reported to be excreted in human breast milk; use of ZYRTEC in nursing mothers is not recommended. **Geriatric Use:** In placebo-controlled trials, 186 patients age 65 to 94 years received doses of 5 to 20 mg of ZYRTEC per day. Adverse events were similar in this group to patients under age 65. Subset analysis of efficacy in this group was not done. **Pediatric Use:** Safety and effectiveness in children under 12 years of age has not been established. **ADVERSE REACTIONS** Controlled and uncontrolled clinical trials conducted in the United States and Canada included more than 6000 patients, with more than 3900 receiving ZYRTEC at doses of 5 to 20 mg per day. The duration of treatment ranged from 1 week to 6 months, with a mean exposure of 30 days. Most adverse reactions reported during therapy with ZYRTEC were mild or moderate. In placebo-controlled trials, the incidence of discontinuations due to adverse reactions in patients receiving ZYRTEC 5 mg or 10 mg was not significantly different from placebo (2.9% vs. 2.4%, respectively). The most common adverse reaction that occurred more frequently on cetirizine than placebo was somnolence. The incidence of somnolence associated with ZYRTEC was dose-related, 6% in placebo, 11% at 5 mg and 14% at 10 mg. Discontinuations due to somnolence for ZYRTEC were uncommon (1.0% on ZYRTEC vs. 0.6% on placebo). Fatigue and dry mouth also appeared to be treatment-related adverse reactions. There were no differences by age, race, gender or by body weight with regard to the incidence of adverse reactions. Table 1 lists adverse experiences which were reported for ZYRTEC 5 and 10 mg in controlled clinical trials in the United States and that were more common with ZYRTEC than placebo.

Table 1. Adverse Experiences Reported in Placebo-Controlled United States ZYRTEC Trials (Maximum Dose of 10 mg) at Rates of 2% or Greater (Percent Incidence)

Adverse Experience	ZYRTEC (N=2034)	Placebo (N=1612)
Somnolence	13.7	6.3
Fatigue	5.9	2.6
Dry Mouth	5.0	2.3
Pharyngitis	2.0	1.9
Dizziness	2.0	1.2

Due caution should be exercised when driving a car or operating potentially dangerous machinery.

In addition, headache and nausea occurred in more than 2% of the patients, but were more common in placebo patients. The following events were observed infrequently (less than 2%), in 3982 patients who received ZYRTEC in U.S. trials, including an open study of six months duration; a causal relationship with ZYRTEC administration has not been established. **Autonomic Nervous System:** anorexia, urinary retention, flushing, increased salivation. **Cardiovascular:** palpitation, tachycardia, hypertension, cardiac failure. **Central and Peripheral Nervous Systems:** paresthesia, confusion, hyperkinesia, hypertonia, migraine, tremor, vertigo, leg cramps, ataxia, dysphonia, abnormal coordination, hyperesthesia, hypoesthesia, myelitis, paralysis, ptosis, twitching, visual field defect. **Gastrointestinal:** increased appetite, dyspepsia, abdominal pain, diarrhea, flatulence, constipation, vomiting, ulcerative stomatitis, aggravated tooth caries, stomatitis, tongue discoloration, tongue edema, gastritis, rectal hemorrhage, hemorrhoids, melena, abnormal hepatic function. **Genitourinary:** polyuria, urinary tract infection, cystitis, dysuria, hematuria. **Hearing and Vestibular:** earache, tinnitus, deafness, ototoxicity. **Metabolic/Nutritional:** thirst, dehydration, diabetes mellitus. **Musculoskeletal:** myalgia, arthralgia, arthrosis, arthritis, muscle weakness. *Psychiatric:* insomnia, nervousness, depression, emotional lability, impaired concentration, anxiety, depersonalization, paroniria, abnormal thinking, agitation, amnesia, decreased libido, euphoria. **Respiratory System:** epistaxis, rhinitis, coughing, bronchospasm, dyspnea, upper respiratory tract infection, hyperventilation, sinusitis, increased sputum, bronchitis, pneumonia. **Reproductive:** dysmenorrhea, female breast pain, intermenstrual bleeding, leukorrhea, menorrhagia, vaginitis. **Reticuloendothelial:** lymphadenopathy. **Skin:** pruritus, rash, dry skin, urticaria, acne, dermatitis, erythematous rash, increased sweating, alopecia, angioedema, furunculosis, bullous eruption, eczema, hyperkeratosis, hypertrichosis, photosensitivity reaction, photosensitivity toxic reaction, maculopapular rash, seborrhea, purpura. **Special Senses:** taste perversion, taste loss, parosmia. **Vision:** blindness, loss of accommodation, eye pain, conjunctivitis, xerophthalmia, glaucoma, ocular hemorrhage. **Body as a Whole:** increased weight, back pain, malaise, fever, asthenia, generalized edema, periorbital edema, peripheral edema, rigors, leg edema, face edema, hot flashes, enlarged abdomen, nasal polyp. Occasional instances of transient, reversible hepatic transaminase elevations have occurred during cetirizine therapy. A single case of possible drug-induced hepatitis with significant transaminase elevation (500 to 1000 IU/L) and elevated bilirubin has been reported. In foreign marketing experience the following additional rare, but potential severe adverse events have been reported: hemolytic anemia, thrombocytopenia, orofacial dyskinesia, severe hypotension, anaphylaxis, hepatitis, glomerulonephritis, stillbirth, and cholestasis. **DRUG ABUSE AND DEPENDENCE** There is no information to indicate that abuse or dependency occurs with ZYRTEC. **OVERDOSAGE** Overdosage has been reported with ZYRTEC. In one patient who took 150 mg of ZYRTEC, the patient was somnolent but did not display any other clinical signs or abnormal blood chemistry or hematology results. Should overdose occur, treatment should be symptomatic or supportive, taking into account any concomitantly ingested medications. There is no known specific antidote to ZYRTEC. ZYRTEC is not effectively removed by dialysis, and dialysis will be ineffective unless a dialyzable agent has been concomitantly ingested. The minimal lethal oral dose in rodents is approximately 100 times the maximum recommended clinical dose on a mg/m^2 basis and the liver is the target organ of toxicity. **DOSAGE AND ADMINISTRATION** The recommended initial dose of ZYRTEC is 5 or 10 mg per day in adults and children 12 years and older, depending on symptom severity. Most patients in clinical trials started at 10 mg. ZYRTEC is given as a single daily dose, with or without food. The time of administration may be varied to suit individual patient needs. In patients with decreased renal function (creatinine clearance 11-31 mL/min), patients on hemodialysis (creatinine clearance less than 7 mL/min), and in hepatically impaired patients, a dose of 5 mg once daily is recommended. Cetirizine is licensed from UCB Pharma, Inc.

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Smithsonian Highlights

Plan a Smithsonian visit in 1996!

Join in the fun as the Smithsonian celebrates its 150th anniversary with a year of special exhibitions and events. *Receive a free Associates' planning packet.* Write Smithsonian Information, Smithsonian Institution, Washington, D.C. 20560, or call 202-357-2700 (voice) or 202-357-1729 (TTY), 9 A.M.- 5 P.M., Monday-Friday; 10 A.M.- 4 P.M., Saturday-Sunday. *Note:* Parking near the Smithsonian is limited. The Metrorail subway system, convenient to all museums, has parking available at some stations (details in packet).

Begin your visit at the Smithsonian Information Center's Associates' Reception Desk—open 9 A.M.- 4 P.M. daily—in the Castle. Special materials await you there. The National Museum of Natural History's Court Dining Room offers Associates a discount on daily buffet service, 11 A.M.-3 P.M.

Museum Hours

Smithsonian museums are generally open 10 A.M.- 5:30 P.M. daily. Hours at the National Zoo are 9 A.M.- 4:30 P.M. daily for buildings, and 8 A.M.- 8 P.M. for grounds.

Art Night on the Mall

The Freer, Sackler, Hirshhorn and African Art museums will be open Thursday evenings until 8 P.M. through August 29. The Ripley Center's International Gallery and the Hirshhorn's outdoor Full Circle Café will also remain open.

Festival of American Folklife

The 30th annual Smithsonian Festival of American Folklife will be held on the Mall, June 26-30 and July 3-7, from 11 A.M. to 5:30 P.M., with dance parties and concerts from 5:30 to 7 P.M. daily. This year's programs will feature Iowa, the American South and working at the Smithsonian.

'America's Smithsonian'

New York Coliseum, New York City (June 11-July 24). Centerpiece of the Institution's 150th anniversary celebration, the traveling exhibition showcases such Smithsonian treasures as Abraham Lincoln's top hat, the ruby slippers from *The Wizard of Oz*, Jacqueline Kennedy's Inaugural gown, a baseball autographed by Babe Ruth and a moon rock. *Note:* Admission is free, but passes are required. Advance passes are available six weeks prior to the opening date for a service fee of $3.50 each by calling 1-800-913-TOUR. The "Smithsonian Voices of Discovery" program, sponsored by the Smithsonian Associates, will bring a series of complementary lectures to New York on June 17-21 and 24-28. For information, call 202-357-4800, ext. 274.

Special June Exhibits, Events

National Museum of African Art
Crowning Achievements: African Arts of Dressing the Head (through August 18) Traditional and contemporary hats, headdresses and hairstyles. See *Highlights Continued*, page 28.

National Air and Space Museum
The Enola Gay (runs indefinitely) Exhibition features the forward fuselage of the *Enola Gay*, the B-29 that dropped the atomic bomb on Hiroshima.
Africa: The Serengeti (6:15 P.M. daily) Imax film follows migration of wildebeests.

National Museum of Natural History
Manatees (June 14-January 1, 1997) Photographs by Karen Glaser capture Florida manatees in their native habitat.
Gems and Minerals Hall Gallery is closed for renovation until late 1997. The famous Hope Diamond is on view on the second floor of the Rotunda.

National Zoological Park
Think Tank New permanent exhibit explores the biology and evolution of animal thinking. See page 32.

National Museum of American History
Smithsonian Institution Staff Photo Contest Winners (through September 3) Results of an institution-wide photography contest.
First Ladies: Political Role and Public Image Permanent installation looks at the various roles of our nation's First Ladies.

National Postal Museum
Located next to Union Station on Capitol Hill, the museum tracks the history of the nation's mail service.
The 25th Anniversary of the United States Postal Service (opens June 14) Exhibit highlights the events that led to the 1971 Postal Reform Act.
Artistic License: The Duck Stamp Story (opens June 28) Permanent exhibition examines the role of Federal Duck Stamps in preserving waterfowl habitats.

The Castle—Great Hall
Smithson's Gift New permanent display tells the story of the British scientist whose bequest founded the Smithsonian 150 years ago.

Hirshhorn Museum & Sculpture Garden
Distemper: Dissonant Themes in the Art of the 1990s (June 20-September 15) Works by ten internationally based artists.
Directions—Beverly Semmes (through June 23) Monumental fabric sculpture.

Freer Gallery of Art
The Life of a Japanese Painting (through September 29) Exhibit of recently conserved paintings explores issues of repairing rare works on delicate silk, paper.

Arthur M. Sackler Gallery
Paintings by Masami Teraoka (June 30-December 1) Works by the contemporary Japanese-born artist use images of death, AIDS and sexuality to portray the realities of the late 20th century.

Arts and Industries Building
Visual Journal: Harlem and D.C. in the Thirties and Forties (through September 29) Images by African-American photographers such as Robert H. McNeill and Gordon Parks.

S. Dillon Ripley Center, Rotunda Gallery
Picturing Natural History (June 29-August 25) Works by members of the Guild of Natural Science Illustrators. See page 58.
International Gallery
Artists at Work: A Smithsonian Celebration of Staff Creativity (June 18-August 11) Juried exhibit features staff artwork.

National Portrait Gallery
1846: Portrait of the Nation (through August 18) Exhibition focuses on 1846, the Smithsonian's founding year.

National Museum of American Art
Lost and Found: Edmonia Lewis' Cleopatra (June 7-September 22) Display features the long-missing sculpture *The Death of Cleopatra*, c. 1875, by Edmonia Lewis.

Renwick Gallery
Mark Lindquist: Revolutions in Wood (through July 7) Art of the woodturner.
Lia Cook: Material Allusions (through July 7) Innovative wall hangings.

Anacostia Museum
Down Through the Years: Stories from the Anacostia Museum's Collection (through August 11) Objects reveal stories about the African-American experience.

Heye Center, National Museum of the American Indian (New York)
Partial Recall: Photographs of Native North Americans (through July 21) Exhibit examines the relationship between photography and identity.

Cooper-Hewitt, National Design Museum (New York)
The exhibition galleries of the museum are closed until September 17.

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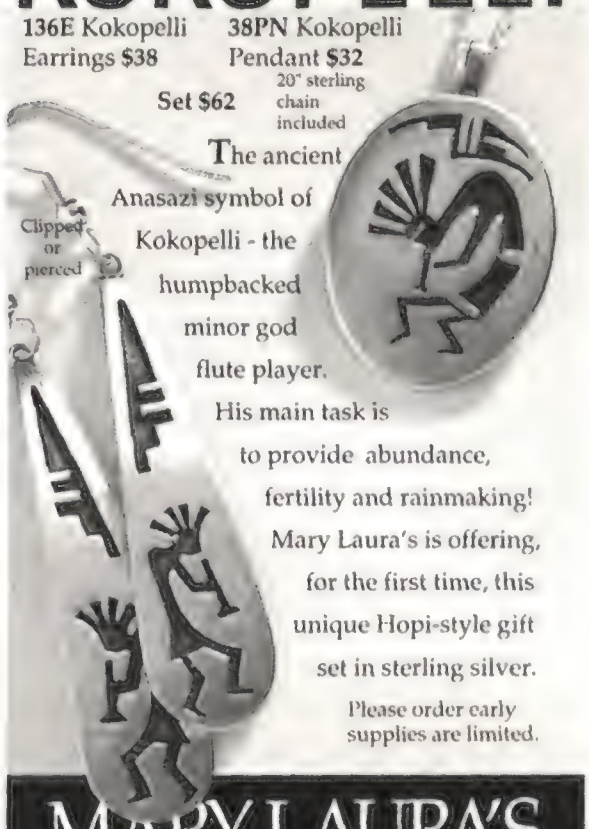

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Highlights Continued

Out of Africa: heady adornments

In African societies, as in many cultures, the material language of hats, headdresses and hairstyles has for centuries served to communicate key messages about the attitudes, values and beliefs that shape the human experience. This rich "language" is at once an art form, a cultural artifact and a fashion statement. From simple cotton caps to elaborate silver crowns, from Tuareg turbans to the beaded diadems of Rwandan kings, a seemingly infinite variety of headgear has fulfilled a host of social and religious functions. Whether worn by kings or warriors, brides or priests, African headwear speaks volumes.

A compelling array of these head coverings can be seen at the National Museum of African Art through August 18. Organized by UCLA's Fowler Museum of Cultural History, "Crowning Achievements: African Arts of Dressing the Head" explores the esthetic richness, technical artistry and symbolic significance of traditional and contemporary headgear. Dating from the early 1800s to the present, the 180 objects in the show constitute a cross-cultural survey of Africa's arts of personal adornment.

"These works of art illustrate how people use hats to construct social identities, and to enhance and transform their lives," says Mary Jo Arnoldi, curator of African ethnology at the National Museum of Natural History and co-curator of the exhibition. "Headwear is one of the most inventive art forms to come out of Africa."

Diane M. Bolz

Elaborate embroidery of man's hat from Côte d'Ivoire marks it for special wear.

Skin and feather hat was worn by Kuba kings and senior titled men in Zaire.

Hat worn by leaders of the Ekonda of Zaire is fashioned of raffia and brass.

Multihued beaded patterns embellish bicorn chief's headdress made by the Pende peoples of Zaire. Horns link the wearer to the strength of the buffalo.

Elephant image, a symbol of power, adorns Hausa man's hat from Nigeria.

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High above some astonished spectators, an orangutan named Bonnie makes her way home after a day of 'schoolwork' in the Think Tank

Photographs by Michael Nichols

By Bil Gilbert

New ideas in the air at the National Zoo

In Washington, D.C. there is, to put it conservatively, an abundance of institutes, centers and foundations that are collectively referred to by inside-the-beltwayers as think tanks. These establishments have various agendas and reputations, but there is only one where crowds gather to watch the principals actually do their cogitating. It is located at the Smithsonian's National Zoological Park. There, for the past several months, a number of orangutans have been commuting more or less daily from their residence at the Great Ape House to a new high-tech facility that is called, yes, the Think Tank.

To go between the two buildings, which are about 500 feet apart, the orangutans clamber up steel towers and then swing across a pair of heavy cables. They are separated from people watching on the ground by 35 feet of empty space. The orangutans make the traverse hand over hand, foot over foot and in combinations thereof, much as wild members of the species have been observed moving through tropical forests on swaying vines and branches.

The O-Line, as the overhead system is called, is now a dominant feature at the National Zoo. Somewhat as do carnival barkers or mimes performing outside a store, the O-Line trapeze artists irresistibly attract spectators and lead most of them into the Think Tank to find out what is going on.

No more room for monkey business

After three years of planning and construction, and the expenditure of some $4 million, the former Monkey House—the National Zoo's oldest standing building—was converted into the Think Tank and opened to the public last fall. The general ambiance of the place is that of a progressive, well-endowed educational institution. This is the intended effect, according to Benjamin Beck, the project director. "We wanted," he says, "to present information about cognitive behavior in an atmosphere that encourages visitors to reflect on scientific methods as they might in a classroom or library."

Accordingly, the central gallery offers a series of interactive exhibits that amount to a continuous, multimedia lecture. The series opens with an essential academic qualification: since other species never testify directly as to how their minds work, all of our judgments about their mental processes are necessarily speculative. Whether a particular behavior is thoughtful depends ultimately on what the observer thinks thinking is. Opinions on the subject have been numerous and often contradictory, but presently most interested students define thinking more or less as it is defined at the Think Tank.

Thoughtful acts involve intent—a purposeful effort to achieve goals or solve specific problems. They demonstrate flexibility—the capacity to choose between various courses of action—as genetically programmed, instinctive, or innate, behaviors do not. Thinking also requires the ability to form and respond to mental representations of things that are not present.

When Rob Shumaker puts an apple onscreen and holds up a piece, Indah ponders what symbol to press.

With text, light and keyboards, interactive games and other state-of-the-art displays, the exhibits in the central gallery apply the foregoing definition to various animals. It is pointed out, for example, that salmon swimming upriver to lay eggs in the exact place where they were hatched years before are certainly purposeful. But the fish will die rather than spawn in another, more accessible and equally suitable place. Thus, by the Think

Then she touches the correct symbol (top) and receives her reward. Indah is the Think Tank's best "student."

Tank's definition, their behavior is innate, or instinctive, insufficiently flexible to be thoughtful. A chimpanzee selecting a stem to extract edible termites from their nest is offered as an example of a true thinker. Come heaven, hell or high water, beavers will build dams across narrow streams because they have been genetically programmed to do so. But if their dam is threatened by rising waters, beavers may respond thoughtfully by cutting spillways in it.

The Think Tank provides a variety of settings for research on animal cognition. In an elaborate terrarium, a colony of tropical ants cut and process leaves, then tend and harvest the fungus gardens that grow on the leaves. The ants do so with machine-like regularity and precision, demonstrating what the exhibit characterizes as complicated innate but thoughtless behavior. In a greenhouse-like enclosure, nine Sulawesi macaques, notably social monkeys from Indonesia, go about their regular business. Here observers are urged, on the basis of what they have learned elsewhere in the Think Tank, to decide if and in what circumstances the macaques are thinking.

Staging an event for man and ape

These and other exhibits in the Think Tank are artful and informative, but the main attraction is a glass-walled amphitheater where members of the staff and the Zoo's orangutans appear in "behavorial events" for the edification of visitors. The style and substance of the performances vary, but a recent one might theatrically be described as follows:

Cast: Benjamin Beck, biologist and project leader; Rob Shumaker, graduate student specializing in orangutan language use; Dan Shillto, graduate student specializing in orangutan self-awareness; Indah, 16-year-old female orangutan.

Setting: Indah lolls against a wall with windows, outside of which runs an open, elevated counter, or stage apron. About 40 spectators are seated in front of and below the counter. Indah and spectators regard each other with what appears to be mutual curiosity.

Act I: Beck enters from the right and explains that he, Rob and Dan are interested in whether orangutans are aware of the thought processes of people and can analyze or empathize with them. Pondering the matter earlier in the day, staffers devised an ad hoc experiment. Beck provides some background.

Since people at the Zoo are constantly unlocking and locking doors, Beck says, they carry sizable key rings. Misplacing them causes extreme vocational panic. Orangutans, who are known to be unusually observant creatures, seem to be well aware of how the key rings are prized by keepers. All of which suggested the behavioral event that then begins as Beck exits.

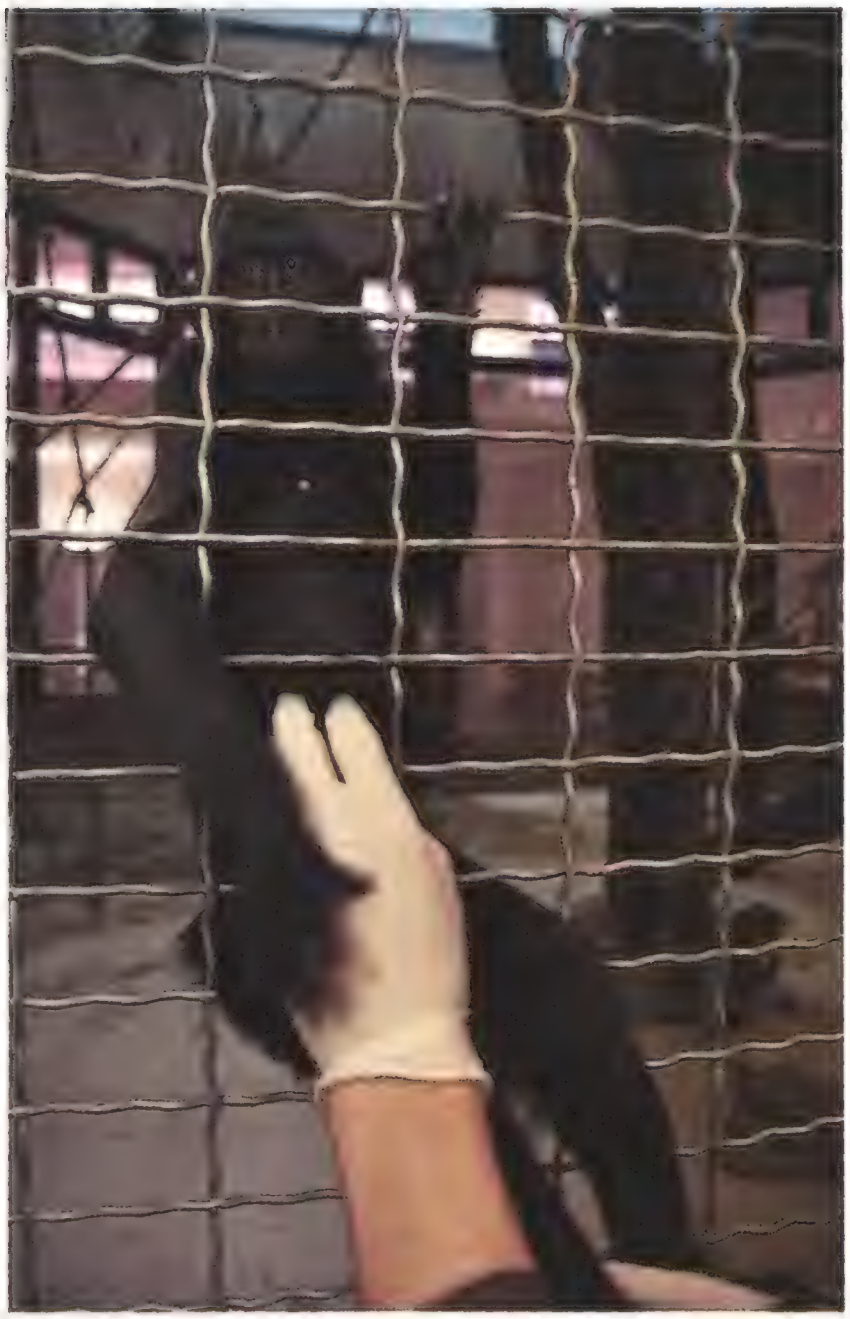
Rob enters from the left, ostentatiously twirling his key ring. He greets Indah with a casual wave. She responds with a friendly expression and taps on the glass wall. A pencil drops from Rob's pocket. As he bends down to pick it up, he drops the key ring. Indah watches intently. Apparently unaware of what has happened, Rob blithely exits right, leaving the key ring where he dropped it.

Dan enters from the left and, feigning surprise, finds the key ring. He picks it up and shows it to Indah. His gestures and facial expression indicate he is puzzled. Indah stares at him while rubbing her hands together.

Her gestures and facial expressions are seemingly pensive. After a bit of this byplay Dan strolls across the stage, places the key ring on a stool and exits.

Act II: Beck re-enters from the right and asks the spectators if they think Indah is aware of all the business with the key ring. Those who respond agree that she is. Beck says the scientific point of this charade is to discover what, if anything, Indah thinks about the happening. If, for example, Rob returned and she tried to draw his attention to the misplaced key ring, this behavior would suggest Indah had reflected on the problem. Beck advises the audience that this experiment has not been conducted previously at the Think Tank or, so far as he knows, anyplace else. Therefore he has no better idea about what may happen next than the spectators do.

Act III: Rob re-enters from the left and frantically searches the area where he dropped the key ring. He looks inquisitively at Indah, who stares impassively at him. Then her attention seems to shift to a woman in the audience who is wearing a brightly colored, sharply pointed stocking cap. Rob continues to behave in a distraught manner for several minutes. Then Dan enters, goes to the stool, picks up the keys and hands them to Rob, who pantomimes gratitude. Indah watches but appears to be only mildly interested in the exchange. She shuffles away from the glass and finds one of the pieces of burlap fabric that are provided for all the orangutans. She sits down, carefully covers her feet with the burlap and stares at the ceiling.



A macaque named Raya responds gently to an overture from attendant seeking to gain the creature's trust.

Beck returns and concludes the behavioral event by saying that science is a process of testing hypotheses. Negative results, he says, are sometimes as instructive as positive ones.

Backstage, Dan Shillto says that hypothesizing is the easy part of this research. New questions about the behavior of orangutans are constantly popping into his mind. The hard, crucial thing is coming up with ways to ask the questions that will engage the minds of the animals. Perhaps Indah is incapable of analyzing the lost-keys problem and responding to it as the researchers thought she might. Or she may have fully understood the happening but on reflection found it insufficiently relevant or interesting to merit any response.

Tracey Barnes, a volunteer at both the Great Ape House and the Think Tank, was involved in an incident that anecdotally supports the proposition that orangutans may try to influence human behavior, or even take advantage of it, after noticing something a person has done. A particularly cunning 19-year-old orangutan named Bonnie has a well-deserved reputation for keeping an eye on new keepers to see if they are careless about leaving desirable objects within reach or can be worked for special treats or privileges. "A few weeks after I started here," says Barnes, "I was fixing something in a narrow corridor outside Bonnie's place. She reached through the bars and tried to grab my tools. I told her to stop it and she did. Orangutans are very aware of our rules. When they are caught breaking them they appear to be contrite, but I am not sure they are."

After being admonished by Barnes, Bonnie picked up a piece of burlap and held it over her face. From time to time she peeked out to make seemingly apologetic and comical faces at Barnes, who was amused until she looked down and saw Bonnie's foot edging toward the toolbox. "It seemed pretty clear to me she was intentionally trying to distract and deceive me."

Orangutans have been an important part of the Think Tank idea from the very beginning. The National Zoo has nine of the animals, all captive-bred, and it is responsible for maintaining them properly throughout their lives, which may last 50 years or more. Presently the youngest is a 5-year-old male, Chang. The eldest and sire of four of the others is Junior, a 30-year-old.

What can best, if anthropomorphically, be described

On their way from the Think Tank to the Great Ape House in the background, a trio of orangs hang out on one of the eight O-Line towers. An electrified wire skirt beneath the platform keeps them from descending.

as boredom may cause serious behavioral problems for mentally complex and active animals in zoos. Consequently, zookeepers are eager to provide interesting devices and activities that will, as they say, enrich the lives of their charges. Once this may have been unwittingly accomplished by the animal shows that were commonly staged at zoos, mainly to attract and amuse visitors. Those entertainments fell out of favor because they were deemed exploitative. Today zoos are encouraging animals to extend their natural talents and abilities. Thus elephants paint pictures (SMITHSONIAN, December 1990) and play musical instruments, sea lions cavort through the water like porpoises and orangutans go to "school" at the National Zoo's Think Tank.

In their native Borneo and Sumatra, orangutans spend most of their time high up in trees and adults appear to lead rather solitary lives. In research laboratories and zoos, as well as in the wild, the orangs' cognitive behavior has been less well studied than that of more terrestrial and social chimpanzees. However, many students who have worked with all of the great apes have the impression that, though their minds seem to work in somewhat different ways, orangutans are at least the cognitive equals of the others. Benjamin Beck, whose research specialty is tool use, shares this opinion. He says that if a keeper leaves a screwdriver within reach of a chimpanzee, the animal is likely to examine and fool with it for a time and then move on to something else. In the same circumstances, an orangutan may rather pointedly and perhaps deceptively ignore the tool at first. Later that night, when the keeper has gone home, the orang might use the screwdriver to dismantle its cage and escape. "'Reflective,' 'contemplative,' 'insightful,' 'deliberative'—these are words I associate with orangutans somewhat more than I do with chimps," says Beck.

When Beck and his colleagues were planning the Think Tank, they realized early on that, due to space limitations, not all of the Zoo's nine orangutans could be permanently located there. That being the case, it

Bil Gilbert's homage to softball appeared in the April issue. Last year he wrote about the War of 1812, sect leader James Strang and armadillos.

was necessary to find a way to get them to and from the Great Ape House, where they have long had satisfactory quarters. The O-Line, which actually was conceived long before the Think Tank, was a spectacular solution to this problem.

The overhead cables are supported by eight 45-foot-tall towers. One of those towers is erected within the orangutan yard at the Great Ape House; another is erected in the outdoor enclosure at the Think Tank. Except when the O-Line is closed because of inclement weather, the animals are free to climb these two towers whenever they please during the day. At the top of each of the six intervening towers is a platform where the orangutans can rest and reflect as they travel between the two buildings. To prevent them from descending and roaming about in the Zoo grounds or elsewhere, a barrier of charged electrical wires is fixed just below each platform.

The O-Line was experimentally opened in September 1994. The adventuresome Bonnie was the first to travel its length. She was followed shortly by her son, Kiko, and another female, Iris. Several months later, an 18-year-old male named Azy got into trouble. Touching the charged wires, he became disoriented and forced his way over them to the ground. A veterinarian on duty that day was able to subdue the 250-pound animal with a tranquilizer gun. The O-Line was closed for repairs and modifications. Fortunately, Azy did not suffer any real injury, but since his shocking experience he has not had anything to do with the cables, a decision that appears to reflect well on his thought processes. Several other orangs have investigated portions of the O-Line and are expected, in their own good time, to become regular commuters.

Swinging along on the cables, the animals look down on the roof of the Reptile House, an ornamental duck pond, a number of trees, bushes, Zoo paths and pedestrians. People at the Think Tank believe this mode of travel is a uniquely enriching experience, since no captive orangutans elsewhere have such a facility.

As far as her travel and housing arrangements are concerned, Indah, of the "Lost Keys" skit, is a special case. Behind the demonstration area in the Think Tank, there is a holding area. Indah was brought there for a physical

Apparently made uneasy by the photographer's bright lights, Indah "protects" herself with a piece of burlap. She is using the cloth as a tool, just as she would employ a leaf in the wild to shade herself from the sun.

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People get tested, too; here, curator Lisa Stevens looks on as children play a game stressing language skills.

Shumaker tells visitors that he always ends a language session by letting the orangutan get a correct answer.

examination which, in the case of an orangutan, requires that the animal be anesthetized. When the procedure was completed, Indah declined to leave even though she had access to the O-Line. Therefore she has remained a full-time resident in the Think Tank, along with Azy, who was moved there last fall.

Indah, Bonnie, Iris and Kiko receive praise and small edible treats when they take part in demonstrations or research projects. Otherwise they are not pressured to perform or, in the case of the commuters, to show up at all. They volunteer eagerly, apparently more for the excitement of the thing than for the insignificant rewards. They seem to enjoy their interactions with the staff.

Many animals are known to employ external objects very much as we do tools; which of them are thoughtful tool-users remains a speculative matter. In this regard, much attention has been paid to primates, who manipulate many objects as well as or better than people do and often appear to do so purposefully, innovatively and imaginatively.

Orangutans will stack boxes to facilitate reaching previously unreachable things. They selectively collect leaves and use them to ward off the sun or rain somewhat as we use parasols. Those swatches of burlap given to the animals at the National Zoo serve as leaf substitutes. They use them as portable tents or blankets, and occasionally as nets or lassos for dragging objects into their cages. Orangutans use sticks as probes, rakes and levers; they sometimes bend, break or chew on them to manufacture more efficient or specialized utensils. The National Zoo's orangutans have discovered that, with the right sort of stick, they can jam open the valves of watering devices so they flow continuously. Having done so, they entertain themselves by filling buckets under the taps and playing messy water games. They also will put biscuits in a hat or bowl, add water and make gruel, all on their own initiative.

In public behavioral events, the orangutans obtain cereal nuggets by using bamboo rods to drag them under the windows. This is a fairly simple demonstration, but most spectators seem to be convinced that it is an example of thoughtful tool use. The Orangutan Language Project being carried on at the Think Tank is a much more complicated proposition for both the animals and the people.

Lions roar, roosters strut, fireflies flash and most, possibly all, other animals transmit specific information about their conditions and intentions. If and when any of them use language as we define it—communication by means of abstract symbols and syntax—remains a complex question for behaviorists. In this matter, primates again have been of special interest. To date, much of the work has involved chimpanzees; their ability to learn and use sign language and other abstract symbols has been well documented. One long-term

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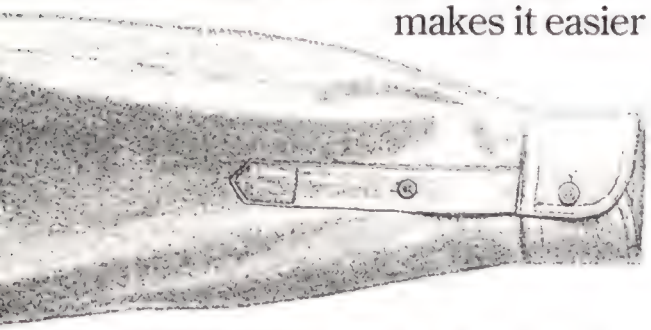

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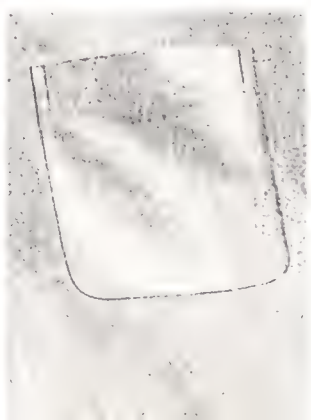

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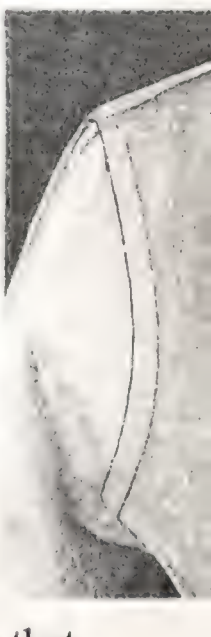

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While Iris watches, Indah concentrates on corralling grapes located beyond reach by probing with a stick.

orangutan study has been documented. That project used sign language, but it involved only a single animal.

Rob Shumaker, the Orangutan Language Project coordinator at the Think Tank, hopes to expand on previous primate studies to investigate the specific capabilities of orangutans. As a first step, he has introduced the participating animals to sets of plastic flash cards. On each of them is a boldly printed geometrical figure—in essence, a "word" symbolizing a thing, condition or concept. Some represent general nouns—"chow," "banana," "bag," "burlap." Others represent proper ones—"Rob," "Indah" and so on. All of the Think Tank people and orangutans have been assigned distinctive symbols. There are also flash cards for adjectives and numbers (zero to nine). Shumaker is now teaching the orangutans, in public view, to recognize the symbols and their assigned meanings. He is also showing them how to indicate that they recognize images projected on a screen—a picture of an apple, for example—by tapping corresponding symbols on a panel located directly below the screen. Right answers are rewarded with praise and edible tidbits. Incorrect responses are not rewarded. The entire session is conducted in a positive and encouraging manner. All sessions end with success. If the answer has been wrong, another choice is given until the orang gets it right.

To date, Indah has proved the most apt pupil. She now understands the symbols for "banana" and "apple," and is learning "grape." Impressively, Indah has learned how and why to use the send key on her computer. Before the project began, many anticipated that Bonnie, the notably inquisitive and ingenious orangutan, would be the outstanding student. Although she is still highly motivated, she has often been frustrated, somewhat like a child who has excelled without much effort in most undertakings but is dismayed and discouraged when she cannot cope quickly and easily with a problem.

Based on the experiences of other primate researchers and the progress the National Zoo orangutans have made, Shumaker would not be surprised if, within a year or so, Indah and perhaps others will comprehend a dozen or more of the abstract symbols. But he is less interested in the size of their vocabulary than he is in whether orangutans have or can develop a sense of syntax sufficient to support interspecies dialogues:

"Indah, where is the bag?"

"Rob, which bag?"

"Indah, where is the big red bag?"

"Rob, there is the big red bag."

Shumaker thinks that such exchanges may be possible via computer but are not likely to occur for some years.

Posted prominently on a large red sign at the entrance to the Think Tank is a message that reads: "This exhibit is about animal thinking. It contains some things you may agree with, some you may disagree with and others that may even trouble you. Come, explore and see what you think."

Most visitors pass by without stopping, as if this were a pro forma warning against eating, drinking or shouting in the building. But in fact the sign has been carefully worded and placed, as a low-key acknowledgment that questions about animal thinking are central to one of the oldest and bitterest disputes in the annals of what is commonly called Western civilization. In centuries past, anyone suggesting that orangutans might use tools and language thoughtfully would have been drummed out of polite intellectual society as a charlatan or lunatic, if not pilloried as a dangerous shaman or blasphemous heretic. Even 20 or 25 years ago a scientific exhibit devoted to thinking animals would have been generally considered unseemly.

At the heart of the matter is an ancient conviction which holds that man is not *a* but *the* rational animal. Respectable philosophers and theologians have long

contended that a thinking being must be a human one. Ergo, other animals did not and could not think because they were obviously not human. Concerned scientists supported this orthodox position by demonstrating in various ways that animals were organic machines driven by unalterable instincts, as mills are turned by water and sailing ships are moved by wind. Their behavior might be complex, one scientist acknowledged, but it was devoid of decision making or reflection.

For many the issue is by no means dead and settled, which is why the warning sign stands at the entrance of the Think Tank. It reverberates in current confrontations between creationists and evolutionists; biblical dominionists and animal-rights advocates; cognitive and mechanistic ethologists. There has, however, recently been a notable shift of learned opinion on the subject. Previously many professional thinkers staunchly defended the no-they-don't dogma. Now those in the intellectual mainstream generally agree that some animals sometimes think, as we define it, but they probably do so differently from people and, as measured by human criteria, not as well. Centuries before savants came to this conclusion, many farmers, hunters, trappers, casual naturalists, animal trainers and pet-lovers had already done so. To a greater extent than is usually acknowledged, the accumulated observations of those untutored but commonsensical students of animal behavior served as the foundation for contemporary scientific investigations.

In one exhibit at the Think Tank devoted to the cognitive abilities and accomplishments of people, it is noted that "humans are thinking specialists." Few would argue with the truth of that. But though it is nowhere remarked on, the Think Tank by its very existence demonstrates another human attribute that may be even more singular than our thoughtfulness. The Think Tank celebrates what has been called our yearning to know other bloods. Among us this yearning is so universal, in time and place, that it probably should be considered innate or instinctive.

Another tool adapted for use by one of the orangs is delicately employed to get at elusive peanut butter.

Three themes of the Think Tank are tool use, language and social interaction. A fourth, unstated, is wonder.

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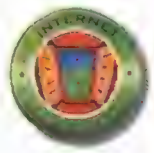

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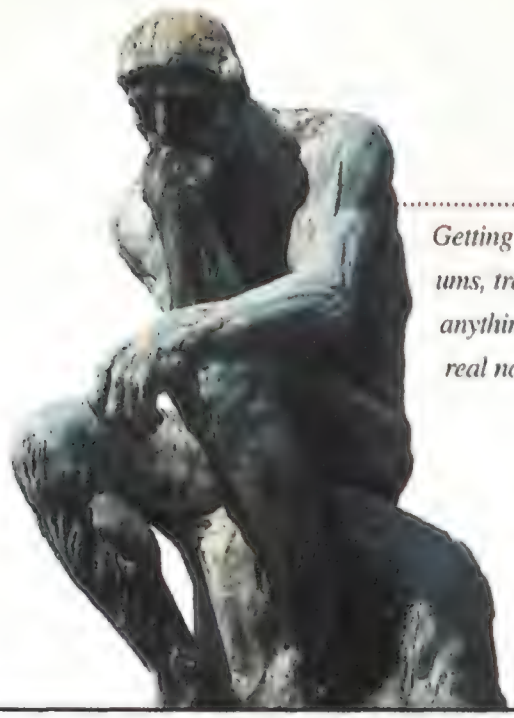

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By Nancy Shute

Houses built to move the spirit—and save trees

The innovative dwellings designed by Seattle architect James Cutler are rooted in the wooded contours of the land they complement

John and Elinor Paulk had the simplest of dreams: a retirement house in the woods overlooking Hood Canal, 30 miles west of Seattle. They'd scrimped to buy land there when John was a young Navy officer based nearby, and had since lived all over the United States, raising three sons in the process. In 1990, they finally purchased a wooded site with a splendid view of the Olympic Mountains. Now they were ready to build.

A friend gave Elinor a book on architects of the Pacific Northwest, and while visiting the area the Paulks called one of them, James Cutler. "We didn't know he was designing a house for Bill Gates," John recalls. "We would have thought, Whoa, this is not for us."

Paulk's trepidation is understandable; Microsoft Corporation chairman William H. Gates III is considered the richest man in America, and the house that James Cutler was designing included a trampoline room and dining space for 100. The Paulks were living in a two-story Cape Cod in Geneva, Illinois; Elinor's idea of a splurge was season tickets to the Chicago Symphony.

When the Paulks learned of Cutler's affluent client, the architect was quick to put the couple at ease, asking them to specify what they wanted in a house. John, a 65-year-old retired commander, wanted a workshop, and

Bridge House, anchored deftly over a streambed, typifies Cutler's environmentally sensitive approach: during construction, only one tree had to be cut.

Cutler, hoisted by colleagues, works from a renovated boatshed (background) at a Bainbridge Island marina.

good heating and insulation. Elinor, a 62-year-old classical music buff, wanted a kitchen with a view, and places for her grand piano and her grandmother's large gilt-framed mirror.

Cutler, a tousle-haired guy in a woolen shirt and well-worn khakis, said the three of them would need to survey the land with a rod and transit, and map the location of its hundreds of trees and shrubs. "He said we should save all the trees, save everything," Elinor recalls.

Still, Cutler's first plan was a shock: instead of elegant elevations they got a pencil sketch that John says looked like "something you'd expect from an 8th-grade drafting student." The Paulks were shaken, but they carried on: more sketches arrived. Cutler solved the land's biggest problem, terrain that sloped away from the view of the mountains, by perching much of the house on 14-foot stilts. Cutler said it reminded him of the raised-framework coal tipples of his Pennsylvania youth.

But there was another problem: getting people *into* the elevated house. Cutler had surveyed the land himself, crawling on hands and knees one afternoon through a thicket of second-growth cedar trees and 12-foot-tall rhododendrons. He decided that people would approach the building over that same thicket, crossing it on a 117-foot-long ramp that would continue straight through the house and extend another 53 feet to a deck with a beautiful view that Cutler calls a belvedere.

Suddenly the project came to life for them all. Cutler started piling on ideas: galvanized-metal light fixtures, exposed studs, concrete walls with deliberately distressed surfaces, Arkansas pine paneling, stainless-steel bathroom sinks. This was no Cape Cod. Cutler slipped the house's simple rectangle into the forest in such a way that only three trees had to be cut; some trees stand within inches of the walls. John Paulk says that even toward the end he wasn't sure what the house would be like. "Jim had a vision, and we just let him go."

Not all architects are so fussy about surveying their sites, but Cutler is an architect with a mission: he wants to change the nature of how people live on the land. Whether it is the Paulks' two-bedroom house or the colossal Gates project, Cutler's vision remains the same: to reintroduce humans to the landscape. "We want to do buildings that connect people to the land," Cutler says.

Cutler's devotion to the integrity of woods and swamps has spawned some remarkable houses, including the Paulks'; a three-bedroom house that bridges a tidal estuary (pp. 46-47); and a house at a nearby botanical garden that commemorates a 62-year-long marriage (p. 56). None of the structures could ever be transplanted; they are as rooted in their spots as an old-growth Douglas fir. And their appeal is not just local; in the past 15 years Cutler's work has earned dozens of honors, including three American Institute of Architects National Honor Awards, the Academy Awards of architecture. "It's incredibly beautiful work," Mack Scogin, former chairman of Harvard University's Graduate School of Design, says of Cutler's efforts. "Beyond simply the visual pleasures, they are beautiful works that have a quality about them that moves your spirit, that touches your heart."

In a mining town, black snow

Cutler grew up playing on the coal-mine slag heaps of Kingston, Pennsylvania, a blue-collar town where, as he remembers it, "by the time the snow was five hours old, it was black." Cutler's father, Joe, a Russian immigrant who worked in a family-owned clothing store, credits his late wife with being the esthetic influence on their only son. "When she trimmed the windows of the store, everything had to be just so."

Cutler, 46, remembers gathering mushrooms in the woods with an uncle and recalls that, as a child, he felt a special affinity for trees. But he had little interest in buildings: he entered the University of Pennsylvania to study anthropology. He was dozing through a sophomore-year art history class when a slide of the cathedral at Amiens, France, flashed on the screen. Cutler was transfixed: "It was a building that embodied the whole culture." He walked out and went straight to the architecture school, "throwing a big fit" until they let him in.

Cutler went on to win a coveted seat in Louis I. Kahn's famous postgraduate studio at Penn. The master was in his 70s and frail, but the designer of such seminal 20th-

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century buildings as the Salk Institute in La Jolla, California, still ran a tight ship.

Kahn died during the spring semester. Cutler considers those few months one of the key experiences of his life. "He always made us go back to the beginnings."

A post-Kahn road trip in 1974 landed Cutler on Bainbridge Island, Washington; it was close to Seattle and it had a campground. He and his wife, Pam, his high school sweetheart, settled in. Cutler worked for Seattle firms on projects including the renovation of the Pike Place Market, then started his own firm in 1977.

Bainbridge Island, Cutler quickly realized, was a remarkable place, rimmed by silvery bays and crowned by a forest of fir, cedar, alder and bigleaf maple. The realities of the Northwestern environment forced Cutler to abandon the brick and masonry he had used in Philadelphia in favor of native woods, and to use glass lavishly to compensate for the dark, wet winters.

Cutler wasn't alone in altering his esthetic to suit the Northwest's dramatic landscape, with its spooky forests, live volcanoes and storm-lashed beaches. Over the last half-century a number of architects in the region had rejected modernism and other "isms" in favor of a "Northwest Regional" esthetic that relies on native woods and stone and recalls traditional Japanese buildings.

"When I moved to Bainbridge Island," Cutler remembers, "it was like moving to paradise. It was wilderness but close to the city." He wasn't the only one who appreciated the island's beauty and the 35-minute ferry commute to Seattle; the forests began to fall, supplanted by subdivisions. "Every month or two, as I rode my bike to work, I'd see a new insult."

Cutler began to experiment with slipping buildings seamlessly into the landscape, and with using buildings as a commentary on the nature that surrounds them. Some experiments were whimsical, like the owl and dragonfly cutouts ornamenting a Catskills fishing lodge. Others, like the 1993 National Honor Award-winning building he designed for Prentice Bloedel, a timber industry magnate, were inspired.

Bloedel had been married to his wife, Virginia, for 62 years, and the two had not been separated for more

Fir-planked ramp, 53 feet long and spanning wooded terrain and a winding footpath, leads to a deck behind the Paulks' two-bedroom retreat. The house perches on stilts to maximize the view and preserve trees.

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than a day or two in all that time. Upon her death, the 90-year-old Bloedel sought to memorialize her in a house at the Bloedel Reserve, a botanical park on the family's former Bainbridge Island estate. The architect and the old man walked around the spot Bloedel had picked for the building, in an unremarkable woods far from the estate's dramatic view of Puget Sound but close to Virginia Merrill Bloedel's ashes, buried several hundred yards away across a meadow.

Cutler quickly decided that the two-bedroom, 1,600-square-foot wooden house would lie athwart stone piers placed on an axis with Virginia Bloedel's grave. The bedroom where Prentice Bloedel slept was angled a tiny bit, so that as he lay in bed he, too, was aligned with his wife. No signs proclaim this connection; only those who care about it the most know it is there. However, the Bloedel Reserve house honors more than Virginia Bloedel. It also sings the praises of wood. The fir post-and-beam frame, connected by hand-forged iron bracing, supports wood-frame, non-weight-bearing walls fitted with panels of glass and cedar siding. Every bit of the house's structure is visible, and the wood glows. It's like a giant jewel box.

The lavish use of wood in the Bloedel and Paulk houses prompts the obvious question: How can a tree partisan like Cutler base his work on chopped-down trees? "It's a good point," Cutler says. "With Gates, we've gone to lumber salvaged from demolished buildings—280,000 board feet, and it's all genuine salvage." Even when it's not recycled from previous structures, Cutler says he can rationalize using wood by revealing its beauty and utility. "I think I can make you see most of it," he says. "It's like living inside something living."

Cutler is really a throwback to an earlier tradition, when architects got their boots muddy and worked with pencil and paper rather than computer-aided design programs and video displays. When I visited the office of James Cutler Architects on Bainbridge Island last spring, Cutler and his staff still were deep in the throes of the Bill Gates house, along with a dozen other projects. In the firm's large main room, Cutler sat with his back to a view of sailboats bobbing outside, facing a table thick with sketches and reports.

Cutler was drawing details for a residence on nearby Vashon Island, his long fingers speeding a brown Berol drafting pencil across graph paper. "There's another," he said, tearing off the paper and checking an empty circle on the main elevation where the detail will go. "I've got just three more to do and this sheet's pretty much done. It's like filling in a jigsaw puzzle." Then he pressed on to the next task—designing door handles for the Gates house. For Cutler, the essence of a building

Nancy Shute has written for SMITHSONIAN *on the travails of lefties and on two Bering Strait sister cities: America's Unalaska, Russia's Petropavlovsk.*

Cutler and architect Peter Bohlin designed Microsoft mogul Bill Gates' residential compound (center), under construction near Seattle: features will include a 20-vehicle garage (left) and a guesthouse (right).

lives in the details: for the Paulks' house, a modest 2,300 square feet, he provided a 100-page book of details, with supplements.

Doing so much of the design work himself means Cutler has precious little time for hikes among the rhododendrons. Even at his house on Puget Sound, where he lives with three daughters, two cats and two ferrets, Cutler often draws into the wee hours of the morning, a tiny TV set on the table keeping him company. A neighborhood poker game and his blue Triumph TR 4A roadster are among his few indulgences.

From the cluttered table at his office, Cutler acknowledges that pursuing his passions has led him on an uncharted voyage. "All of a sudden, you start doing architecture that's not what you expected," Cutler said, his right hand drawing relentlessly while he talked. "The wood residences, the 5,000 details, you can't just pull 'em out of a book and slap 'em in." He laughed softly. "I don't know where that stuff leads. It's an experiment, at times, not one on which I have any control." Cutler stopped and looked at me, a puzzled look in his dark brown eyes. "I forgot to tell you. I don't eat." I looked at my watch. It was 3 P.M. I went in search of lunch, and Cutler kept drawing.

The ultimate Cutler house is the residential complex just now being completed for Bill Gates. It's certainly the only construction project in Medina, Washington, a tony Seattle suburb, for which supermarket tabloid reporters have besieged City Hall in order to see site plans.

Much has been made of the complex's "house of the future" components, which include high-definition television, multimedia and audio systems wired into most of the rooms, and electronic lapel pins that allow your favorite music or videos to follow you around the house as you move. But it was Cutler's insistence on the primacy of the natural environment that led Gates to invite him, in 1989, to participate in a rare paid competition to design the billionaire's dream house.

The project was a challenge by any estimation. The 4.5-acre site was steep, dropping 154 feet to Lake Washington. Besides the high-technology systems, Gates wanted an entertainment pavilion that would seat 100 for dinner, a boathouse, a movie theater, a trampoline room and a 20-car guest garage.

Cutler had never designed a house larger than 5,000 square feet; the Gates job would be almost ten times that large. And he was competing against famous architects around the world. The challenge was irresistible; it was also terrifying.

Then Cutler got a call from Peter Bohlin, his old boss from his first job, at an architecture firm in Wilkes-Barre, Pennsylvania. Bohlin had been asked to compete, too, and suggested they collaborate. Cutler demurred, not relishing the notion of being steamrollered by the older, more eminent Bohlin. So Bohlin started calling his former protégé at 6 A.M., saying,

A sense of inspired serenity pervades the interior of Cutler's stream-straddling Bridge House: glass-block flooring under the wood-burning stove affords a view of a freshet coursing through the ravine 14 feet below.

"One plus one equals three, Jimmy." Cutler finally relented. Their joint proposal melded Bohlin's strengths—a deft hand with concrete, metal and glass in large public buildings—with Cutler's craftsman's detail and feel for landscape.

Bohlin and Cutler's proposal, presented to Gates in two linen-covered boxes, envisioned a house radically different from any other in the neighborhood, and not just because of its size. For starters, Bohlin and Cutler eliminated the lawn—Medina's other houses are swimming in greensward. Instead, they proposed planting native Northwest trees and understory, the kind of stuff the neighbors' gardeners had labored for years to banish. Part of the property's waterfront would be turned into wetlands. In order to fit more than 45,000 square feet of building on the site, the architects planned to tuck 75 percent of each structure underground.

But for all the audacity of their proposal for the Gates house, it wasn't radical-looking. In the original site plan, the bulk of the structures disappears beneath the forest. The visible parts are formed of simple materials: Douglas fir, concrete and stone. There are many windows, to mitigate the long, gray winters.

Having secured the residential commission of the decade, Cutler and Bohlin hired a half-dozen more architects and began shuttling back and forth between Wilkes-Barre and Bainbridge Island, trading sketches and arguing for hours over questions big and small. Bent together over the plans, they look for all the world like two brothers sketching out the world's greatest tree house. Bohlin, 58, big and sandy-haired, is the worldly-wise one, prodding the smaller, younger Cutler to "loosen up, Jimmy."

Work on the Gates house began in 1990, and the site, which had to be excavated to pour earthquake-resistant footings, soon resembled a bombed-out shopping mall. Six years and $30 million or $50 million later, depending on who you talk to, the house is almost done; the move-in date is projected for January 1, 1997. (Completion was first slated for 1994; evidently even the richest man in America isn't insulated from construction delays.) Gates' 1994 marriage to Melinda French, a Microsoft manager, slowed the process; French wanted input into what until then had to have been the ultimate bachelor pad.

Gates has kept the site under tight security (Cutler

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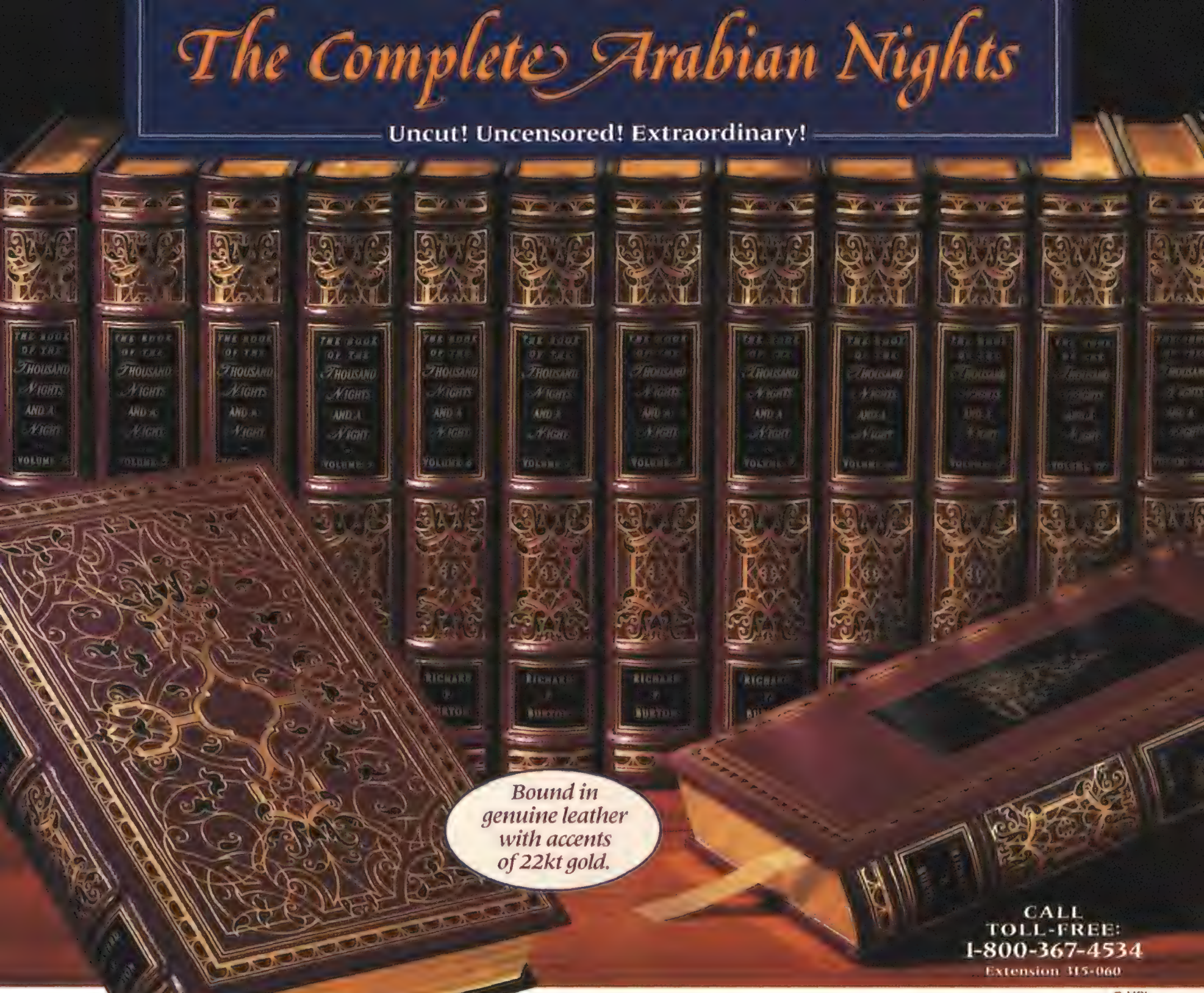

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House set in the Bloedel Reserve, a Bainbridge Island botanical park, recalls a graceful Japanese temple.

and Bohlin are barred from talking about specifics), but enough information has emerged to piece together a vision of the place. The buildings are approached through a gated entry at the top of a curving, 1,000-foot-long road.

A 1,700-square-foot guesthouse lies ahead, built as a test module for the rest of the complex. Thanks to the team's landscape architect, Tom Berger, this structure is almost invisible, tucked behind a concrete wall overhung with alder, bigleaf maple and baby cedar. It's hard to believe that four years ago this thriving forest was a bulldozed construction site. Its present state is one of Cutler's proudest achievements. "We planted red alder, which is considered a weed tree." It's also a nitrogen fixer that nurtures slower-growing evergreens like cedar, hemlock and fir. To further restore the ecosystem, the architects trucked in duff, the fluffy material on the forest floor, from clear-cuts. "It went crazy," Cutler said, of the luxuriant green understory that sprang from the duff. "It just wanted a place to live."

Guests will walk from a vaulted underground garage into a foyer supported by a forest of Douglas-fir pillars. In the reception hall downstairs, 24 huge high-definition TV monitors line one wall. The house also will have an electronic art gallery, a pool and family quarters.

On the lakeshore, rain and groundwater diverted from around the house into a 100,000-gallon cistern below the garage will feed newly created wetlands, nudging a tiny bit of Lake Washington back toward its original state. Gates wasn't thrilled about taking 125 feet of $20,000-a-foot waterfront and turning it into a swamp. But Cutler told him, "You'll mark your life by the changes in this landscape. Your children will come to this place." Wildlife is already finding its way to the forest emerging around the guesthouse. Cutler is confident that animals and fish will migrate to the nascent wetlands as well.

Cutler's best work, by his estimation, isn't the Gates house, or even a building. It's a memorial for the 300th anniversary of the 1692 witch trials in Salem, Massachusetts (SMITHSONIAN, April 1992). For years he and Maggie Smith, a Bainbridge Island ceramic artist and client, had talked about doing a non-architectural project together, one, Cutler said, "with more emotion." When Smith brought him a brochure announcing a competition to design a Salem memorial in 1991, Cutler knew that this was his emotional project.

He had never forgotten how during the 1950s an uncle had needled his father by grumbling that Joe Cutler was the family's Communist. "I didn't know what a Communist was," Cutler said. So he repeated the jibe one day when he and his father were in downtown Wilkes-Barre. The boy was stunned when his gentle dad dragged him into an alley and told him never to use that word. Shortly after that, Cutler saw a production of Arthur Miller's *The Crucible*, the play that used the story of the witch trials to protest the injustices of McCarthyism. Cutler learned his lesson.

Smith and Cutler's design was chosen over 241 others; Arthur Miller unveiled the winning entry. The memorial occupies a pocket of land between a parking lot, an apartment building and an old cemetery. It looks at first like an enticing little park, with black locusts shading low benches. But this is not an innocent place. Inside, the stone benches, already lichened gray, carry the names of the dead: "Rebecca Nurse Hanged July 19, 1692. John Proctor Hanged August 19, 1692. Giles Corey Pressed To Death September 19, 1692." In this quiet quadrangle, Cutler and Smith symbolically laid to rest 20 souls who were denied a decent burial, and make our rest uneasy.

Cutler and Smith are well into their next collaboration, a war memorial dedicated to all those who never returned, in Norfolk, Virginia. Also on Cutler's to-do list is a Presbyterian church in Wenatchee, Washington, and a $40-per-square-foot industrial-park building, which will test whether his siting principles can survive a

At Paulk House, exposed components, including metal plates, bolts, convey respect for building materials.

tight budget. And he says he will always design houses for people, whether they are John and Elinor Paulk or Bill Gates.

The Paulks moved into their house in March 1994, after 20 months of living in a trailer parked in the yard and helping with construction to lower the costs. John cut the path for the ramp through the underbrush himself, with a machete, so that heavy machinery wouldn't disrupt the woods. It took two days. Elinor greeted him at the end with a bottle of champagne. So now, when you approach their front door, the walk across the ramp over the little cedars and lanky forest rhododendrons feels as if you are walking through a national park. Inside, light pours into the living room from nine-foot-high windows; Elinor's grand piano stands in a place of honor.

"We always like to have people walk down the ramp because it's fun," John Paulk says. "You say, what kind of place is this? It looks like a factory on pilings. Then you walk in the door and it's this lovely place."

"We feel relaxed and comfortable here," says Elinor. "People like to come because they feel one with nature. And you don't have to do anything—just hang out and look outside."

The refined art of picturing natural history

An exhibition showcasing works by members of the Guild of Natural Science Illustrators opens at the Smithsonian's Ripley Center

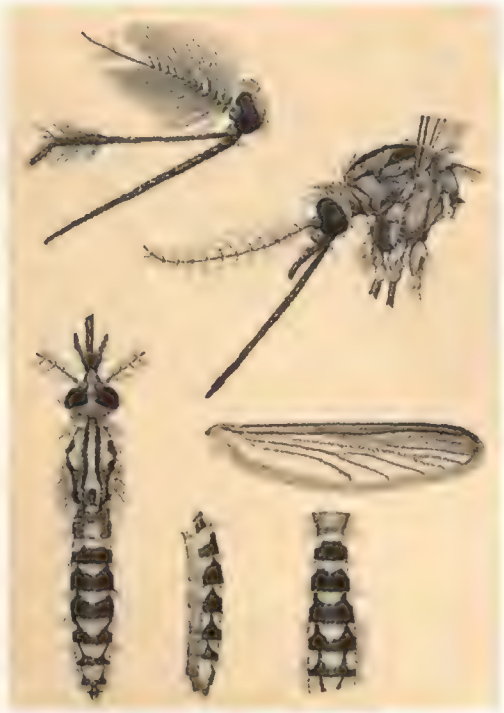
Scientific illustrators, it seems, often keep uncommon company. For several months, Portuguese biologist and artist Nuno Farinha shared his Lisbon apartment with a water lizard he captured in the mountains of northeastern Portugal. Rhode Island illustrator Amy Bartlett Wright stocks her freezer with bird specimens, but insects, particularly caterpillars, are more difficult to preserve. For that reason, Wright spent two years raising 60 different species of caterpillars. She was also raising a young son at the time and spent many sleepless nights juggling feedings—leaves for the caterpillars, milk for the baby, or was it . . .

On a balmy spring night eight years ago, Smithsonian museum specialist Marilyn Schotte lived out a child's dream. In the company of dinosaurs and butterflies, flying fish and giant sloths, she spent the night at the National Museum of Natural History. Sadly, she had little time to explore. Closeted in a laboratory, surrounded by jars of pickled squid and octopuses, she drew larval squid for 24 hours straight to meet an impending deadline.

More recently Schotte has curated a special exhibition that illuminates the art of scientific illustration. "Picturing Natural History," on display in the Rotunda Gallery of the S. Dillon Ripley Center from June 29 through August 25, features works by members of the Guild of Natural Science Illustrators, an international organization founded at the Smithsonian in 1968. Held in celebration of the Institution's 150th anniversary, the exhibit honors the long and fruitful history of scientific illustration at the Smithsonian. Whether etched in copper or conjured on computer, art is one of the most effective means of communicating new information about the natural sciences. From ancient herbal texts to medieval medical books, from accounts of the great exploratory voyages of the 15th century to chronicles of the cosmic journeys of the 20th, scientific illustrators have helped elucidate the secrets of the natural world.

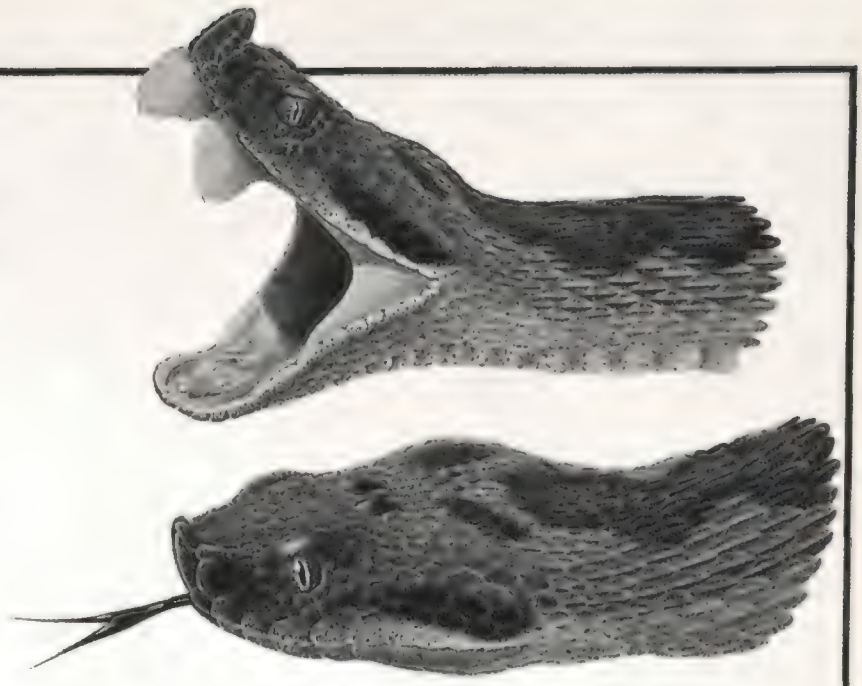
Diane M. Bolz

Branches of gray dogwood, buckthorn and wild rose entwine in delicate watercolor *Fruits in Autumn Hedge* by Bente Starcke King. *Old World Flycatchers from India* (opposite, in progress) by John C. Anderton will appear in *The Birds of the Indian Subcontinent* by S. Dillon Ripley.



Clockwise from top: Massachusetts artist Robin Brickman used cut, sculpted paper, watercolor and pastel to create three-dimensional work *Swallows Learn to Hunt and Fly* for the children's book *Swallows in the Birdhouse.* Smithsonian illustrator Molly Kelly Ryan rendered a holotype of a new species of reef lobster in 1986; the creature, *Enoplometopus chacei,* was discovered in the coral reefs of the northern Philippines. Watercolor of a basket made of spruce root and grass by the Tlingit of southeastern Alaska is by Seattle artist Margaret Davidson. Distinguishing features of the male and female adult *Aedes (Molpemyia) pecuniosus,* a mosquito native to Australia, are depicted by Taina Litwak, who has the unusual honor of having two species of mosquitoes named for her.

Pencil drawing (right) by Portuguese illustrator Nuno Farinha compares the attack and rest positions of the head of a Lataste's viper. Feather-legged fly (*Trichopoda pennipes*), a parasitoid native to the East Coast and a natural enemy of the squash bug, has been introduced into California to help combat the bug's threat to crops; watercolor of the beneficial insect was done by artist Linda Heath Clark. Defining characteristics of five species of another helpful insect, the lady beetle, are delineated in work by Amy Bartlett Wright. *Alarm Flight* (below) captures a pair of Canada geese taking off to defend their nest (from a marauding crow); artist Trudy Nicholson witnessed the scene on the C&O Canal near her Maryland home.



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By Robert Wernick

Where you went if you *really* had to get unhitched

In the days when divorce was still a sin and a shame, the city of Reno grew rich and infamous, catering to domestic disharmony

Reno got top billing on a 1930s magazine devoted to articles that deplore divorce generally. Opposite, a new divorcée plants ritual kiss on courthouse pillar.

In those days there were few Interstates, and you could stop by the side of the road almost anywhere to get a refreshing milkshake. I was paying for such a milkshake at the cash register of a clean well-lighted place in Nebraska, and chatting with the owner.

"Where you headin'?" she asked me.

I replied: "Reno."

Her blue eyes turned a slightly more steely blue. "Young man," she said, "the American people proved once and for all last November that we will never tolerate a divorced man in the White House."

That was 1953, before the development of modern polling techniques, so there is no way of knowing how many people voted against Adlai Stevenson on those grounds, but I have no doubt the number was considerable. My Nebraska friend was right about me, too: I did go to Reno, and I did get a divorce there, and no one ever asked me to run for President.

The first six weeks of what turned out to be two years of residence in Nevada I spent on a ranch at Pyramid Lake about 50 miles out of town. It was a divorce ranch.

The divorce ranch is now long gone and almost forgotten. But it was in its prime then, one of those authentically American institutions that have stamped the social and cultural history of the 20th century. Like the comic strip, the public opinion poll, the jazz band, the soap opera, the motel, the beauty contest, the Internet, it mixed symbolism and pragmatism to create an efficient response to a deeply felt need.

The need in the case of Nevada was money. Nevada, 110,000 square miles of barrenness across the Sierra Nevada from California, an endless vista of naked mountains and sagebrush-covered plateaus where you could travel for days on end without seeing anything in motion but jackrabbits and tumbleweed, was made into one of the United States in 1864 mainly because Mr. Lincoln needed three extra votes in Congress to be sure of passing the constitutional amendment abolishing slavery. Its population could have fit into a few dozen blocks in any big Eastern city. Concentrated mostly in a thin band of greenery at the western end of the desert, watered by melting snow from the Sierra, it could survive only through a combination of hard work and initiative, a bit of luck when a drunken prospector stumbled on a silver mine, and profligate handouts from the federal government. At the turn of the century Nevada discovered that a new source of revenue was available, which was sin; more specifically, divorce.

Divorce was legal in almost all the states of the Union, but it carried a social stigma. Nice people did not do it, and in most jurisdictions the breaking of a marriage was deliberately made a slow, costly and embarrassing process. In a frontier state like Nevada, more tolerant views prevailed. If you had lived within its borders for six months, you could walk into a courthouse, explain to a

judge in private that your spouse had made life impossible for you and walk out free as a bird.

It is probable that many Californians heard of these liberal rules and came across the border for a divorce in the early days, but their names are unknown to history. History would only enter the Nevada courtroom as the 20th century was about to open.

On April 14, 1900, a judge in Minden, Douglas County, granted divorce decrees to John Francis Stanley Russell, age 35, and to Mollie Cooke Somerville, gallantly described as over 18, both of whom had come from England to rid themselves of cumbersome spouses. They had been spending the statutory six months happily together in the bucolic solitude of Glenbrook on the eastern shore of Lake Tahoe. The following day they traveled 50 miles north to be married by another judge in a quiet ceremony at the Hotel Riverside in Reno.

There was no quiet in London when the news was announced there. The bridegroom was an earl. His wife, Countess Russell, was so upset that she canceled her stage performances at the Tivoli Theatre, and his peers in the House of Lords had him arrested for bigamy the moment he returned to England. He was tried and convicted and spent three months in Holloway Prison.

Degrading the honor of Reno's daughters

This otherwise undistinguished earl was to become the role model for a long line of unhappily married celebrities. Every newspaper and every newspaper reader in 1906 wanted to know what was going on when the wife of William Ellis Corey, president of United States Steel, came to Reno with her son a month after her husband had sailed for Europe sharing a stateroom with the actress Mabelle Gilman—conduct that led a writer in the *New York Times* to call him "the worst type of anarchist." After announcing her intention to spend the rest of her life in the great outdoors, the wronged woman got a divorce and headed straight back East with a check for a cool $1 million—a divorce settlement from Mr. Corey—in her purse.

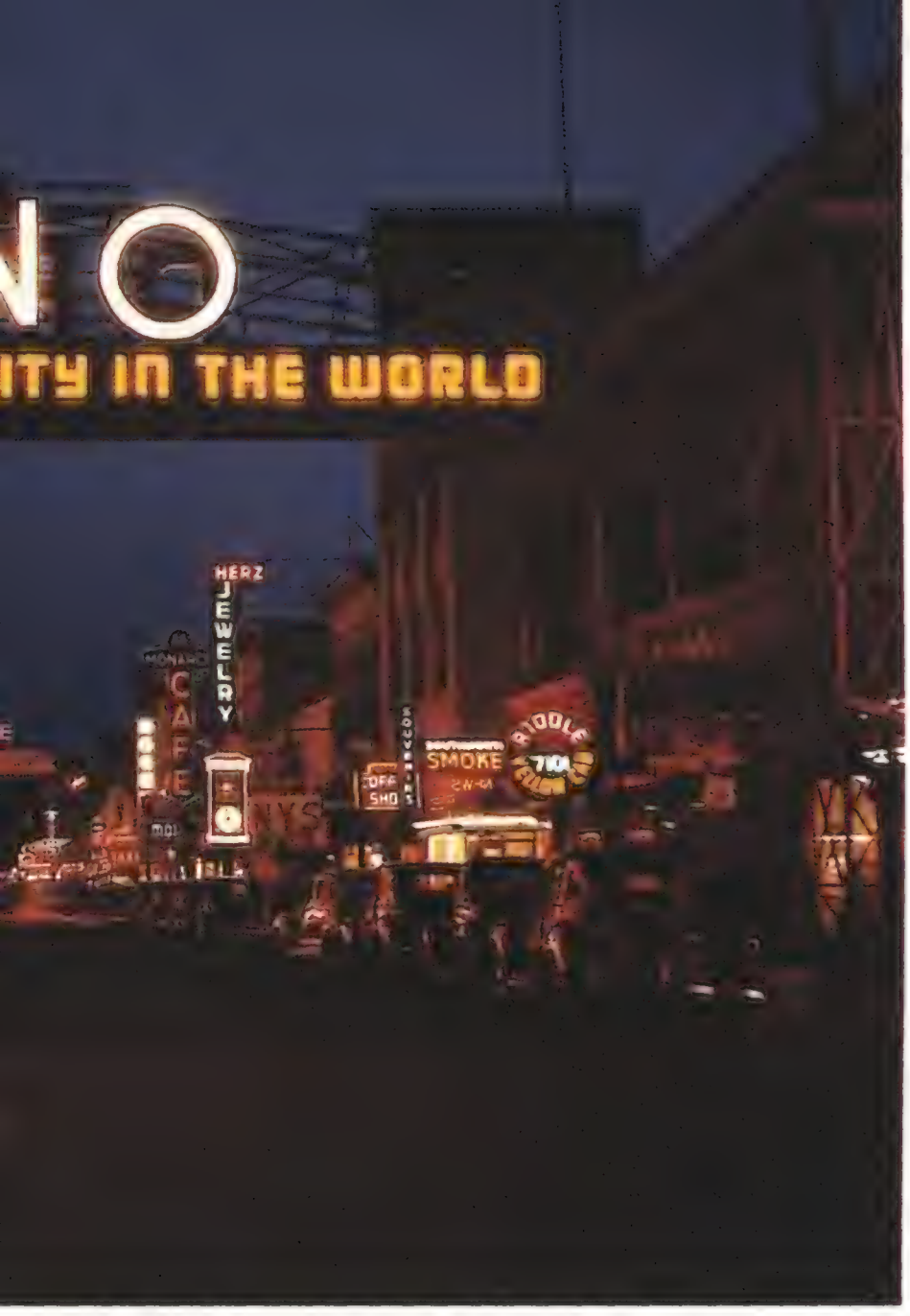
The lesson was not lost on other wives and other husbands, and a steady stream of litigants began arriving in Nevada. Local lawyers were delighted (though one of them was disbarred for advertising Reno divorces in New York newspapers and theater programs), but in 1913 respectable conservative elements bullied the state legislature into extending the residence requirement for a divorce to 12 months. There were then about 500 divorce-bound people residing in Reno. Men among them had, said the *Nevada State Journal*, "degraded and destroyed the honor of daughters of some of the most prominent people in Reno. . . . And it is a continual dread that the mothers of boys see their lads grow up to become the devotees and paramours of women who are prostituting their right to respect and honor."

During the 1940s, Virginia Street flaunted a gaudy claim to fame. Reno's population stood at just 25,000.

The triumph of virtue meant the bankruptcy of law offices and hotels and taverns, and after local politicians made a deal in the state legislature to trade away the state fair to another town, a new law reinstated the old six-month limit, and sin could come back to Reno.

The town's real consecration as the divorce capital of the Western world came in 1920 when actress Mary Pickford, officially proclaimed "America's Sweetheart," arrived in Minden, announcing she expected to live there forever. She had not been there but two weeks when she got her divorce decree, thanks to some fancy legal work by her attorney, Pat McCarran, later to become a famous U.S. Senator, and she promptly hurried back across the state line to marry Douglas Fairbanks sr.

The publicity fallout was enormous, and from then on divorce was a growth industry in Nevada, and Reno was a national byword, a national institution. There were movies and songs about it, and Walter Winchell coined a word for the sea change that despondent spouses went through there: "renovation." In the press, a steady drumbeat of gossip about known or rumored divorce plans fol-



By 1946, the number of divorce decrees granted there each year had soared to an all-time high of 19,500.

lowed each familiar visitor: Jack Dempsey, Sinclair Lewis, Barbara Hutton, Carol Lombard, Edgar Rice Burroughs, no end of Vanderbilts, Mrs. Eugene O'Neill, Mrs. Joe DiMaggio, Mrs. Adlai Stevenson, Bobo Rockefeller, the Maharaja of Indore, Mrs. Clark Gable, Paulette Goddard divorcing Charlie Chaplin, at least one of the many Mrs. Tommie Manvilles, union leader Harry Bridges, two sons and the daughter of President Franklin D. Roosevelt, and Christian Arthur Wellesley, Lord of Cowley. All proved worth a headline when they arrived and a paragraph or two when it was said they had been to wild parties in the saloons on Virginia Street.

Since the days of Achilles and Agamemnon, it had been one of the functions of the upper classes to provide distraction for the masses with their outrageous behavior, and divorce was still outrageous. With copies of Social Registers in hand, the reporters would converge on the railway depot when trains from the East were due in and examine the labels in the baggage room so they would know on whom to swoop.

The most talented of this band of bards was Bill Berry, Reno correspondent of the New York *Daily News* for a quarter of a century. His specialty was ferreting out shy celebrities who might try to escape notice by disembarking at Sparks, a couple of miles east of Reno. But their first Nevada sight would be Bill Berry on the platform. Berry's proudest moment came on a snowy night in April 1945 when he learned that Gloria Vanderbilt di-Cicco, who had been putting in her time at the Riverside Hotel, was going to greet her next husband, Leopold Stokowski, conductor of the Philadelphia Symphony Orchestra and a notorious foe of prying newsmen, at Truckee over the California line as soon as she got her decree. She drove in her Cadillac to greet the train, which was due in at 4 A.M., and there was Bill Berry beside the tracks at the Truckee station.

Gloria fled in a rage back to the car and locked herself in. The train arrived, and Leopold stumbled out into the snow carrying two heavy suitcases and hailed a figure who he assumed was a railway employee. When the figure said, "I'm from the *Daily News*, welcome to Truckee, the back door to Reno," he fled into the middle of the street. Spying him, Gloria put the Cadillac in motion, but since she had only learned how to drive it a few days before, she was going forward when she meant to go backward and was bearing straight down on the maestro. As Bill Berry remembers it, if he had not yelled at her to shift gears, tragedy and a lot of newspaper headlines would have ensued.

Nevada was on the whole quite happy with its celebrities, but celebrities alone were not enough. Even in the prosperous 1920s there were few people who could afford to pay for a six-month withdrawal into the wilderness. In 1931 the state legislature took the decisive step of shortening the residence period to six weeks. This democratized divorce, and the number of candidates rose steadily, from a thousand a year in the '20s to a peak of over 19,000 in 1946, every one of them providing an outlay of hundreds if not thousands of dollars on local goods and services. It added up to millions that saved Nevada from financial ruin.

For Gloria Vanderbilt, as for thousands of ordinary plaintiffs, it became a traditional ritual. After six weeks of lying low within the state boundaries, the wronged spouse would appear in closed chambers in the Washoe County Courthouse, with a witness to testify that she or he had been physically present in Nevada for every one of the previous 42 days. The spouse then swore to the judge that she or he had moved to Nevada with the intention of taking up permanent residence there and explained briefly the circumstances that had made continued married life impossible. The judge signed the

Robert Wernick has done 65 stories for SMITHSONIAN, *most recently on poet Ezra Pound (December 1995). He first visited Reno in the 1950s—to get a divorce.*

decree, and after the payment of a modest fee the deed was done, and it was off to the railway station, sometimes directly, sometimes by a more leisurely path, down the hall to the justice of the peace or across the street to a wedding chapel to exchange new marriage vows. And, the story goes, down Virginia Street to the Truckee River to toss the golden band that marked the former bondage into the riotous waters, then to the Hotel Riverside for champagne till it was time to catch the train back East. Or the newlywed couple might prefer to spend a short honeymoon in some scenic spot such as Lake Tahoe, with the likes of Bill Berry crawling under the floorboards of their bungalow to keep a record of their activities and bribing the local grocery so the *Daily News* could reconstruct their daily menus.

"But where Love leads I always follow"

All that testimony about setting up permanent residence might generally, if not always, be considered perjury, but the State of Nevada has always recognized a person's inalienable right to a change of mind. A false witness, however, about those 42 days in which the plaintiff was spending money inside Nevada could lead to very severe penalties.

Besides being a financial salvation for Nevada, divorce was a drama acted out by tens of thousands of ordinary people, all with individual problems. Except for the most jaded and most mercenary spouses like the countess shedding her fourth husband in Clare Boothe's *The Women*—"Married, divorced! Married, divorced! But where Love leads I always follow,"—divorce is almost always a wrenching experience.

Candidates for a Nevada divorce came from all over the human spectrum—vamps and flappers and ingenues, Harvard professors and truckdrivers, spoiled heiresses and hard-bitten waitresses. The average, and certainly the symbolic type conjured up by the word "divorcée" in those days, was a young woman from the East who had never seen a live coyote or a live cowboy. Now she was thousands of miles from home and hubby, with six weeks to fill with a heady, frightening freedom.

No job, no housework, no children to occupy or distract her, and in a country town where the conversation and the social conventions were different from anything she had ever known. She could hide out in a more or less dingy hotel or boardinghouse, drifting from slot machine to slot machine, and suffer the menace and the boredom of the 20th century. If she had a little money her lawyer might steer her to a divorce ranch, usually a good-sized house out in the country that once had been the center of a working cattle ranch and was now fitted out with bedrooms upstairs or cabins scattered among the cottonwoods, with sturdy horses with Western saddles and wranglers to take care of them.

At the divorce ranch (top) in *The Women* (1939), Rosalind Russell's hat and hauteur fail to impress Marjorie Main. Ann Sothern (left, with John Hodiak) opposes divorce in *Maisie Goes to Reno* (1944). In *The Misfits* (1961) Gable consoles a newly unhitched Monroe.

They began as rough-and-ready Western installations strikingly lacking in modern comforts (northern Nevada, according to one chronicler, had a total of a half-dozen licensed plumbers in 1932) and gradually evolved into a kind of rustic elegance. Their peculiar character came partly from the transient nature of their occupants, with the cast of characters changing every six weeks, and partly from the stark desert landscape with the sturdy virtues and lurking anarchy of the Wild West.

It was a bare and almost empty land. When Russian Louie Strauss shot his business partner, Harry Sherwood, in their gambling parlor at the southern end of Lake Tahoe in September 1947, the only room in the county big enough to hold the mass of witnesses and curious onlookers for the first judicial hearing was the dining room at the Glenbrook Inn. (None of the witnesses found he could conscientiously swear that he had actually seen Russian Louie pull the trigger, and the authorities had to let him go. He soon ceased appearing in his local haunts and has never been seen again.)

Champagne Charlies and Westchester debutantes

You never knew what you were going to come across if you dropped in for a visit at a divorce ranch after a long ride through the sagebrush. The fellow at the bar might be a preacher or a stockbroker, or a bona fide gangster like Russian Louie Strauss. The gal sitting next to you at supper might be an apple-cheeked Westchester debutante, or she might be the sullen young woman who liked, in default of any other device to call attention to herself, to walk down Virginia Street leaving a trail of glass eyes that she dropped through holes in her trouser pockets.

You might meet any one of the Champagne Charlies and Nevada Jacks full of implausible tales of cattle rustlings and illicit loves. You might meet Rita Hayworth divorcing either Aly Khan or Dick Haymes, you might meet the wife of the governor of Massachusetts, or John P. Marquand or Andreas Papandreou, the future premier of Greece. You might meet the man who had spent 20 years in prison staunchly denying that he had ever taken a penny that did not belong to him and, when he got out, went up into the hills with a burro and came down with $200,000 in cash, enough in those days for him to acquire a herd of cattle and some Arabian horses and a Hollywood bride, and was now living the life of a nobleman in a chateau of his own design and enjoying every minute of it.

You might meet Hugh Marchbanks, the mustang hunter who would introduce himself as a dancer, a prancer and a gay romancer, and was only too happy to prove it. Unlike the mustang hunter played by Clark Gable in the movie *The Misfits*, he enjoyed every minute of his life and his romances. When he felt he was getting too old for that kind of thing, he married a cheerful

The deep opposition to divorce resulted in this 1913 cartoon for a story in *Harper's Weekly* about Reno women heading to Carson City to get the six-month residence requirement changed to a year. They succeeded, but in 1915 it was back to six months and was later shortened to six weeks.

waitress and went off to live in a cozy home in Oregon.

Joe Page had been doing an electrical job in Reno, and he was driving back home to Carson City at 2 in the morning when he had a flat tire, and found no jack in the car. There was no nighttime traffic then, and he walked down the highway till he came to a big house. The door was open and he walked in, and into a well-lighted parlor, but there was no one around. He lay down on a couch and fell asleep. In the morning he was awakened by a maid bringing him breakfast on a tray. The house was the headquarters of the famous Flying M E divorce ranch, and the maid assumed he had been out for the evening with one of the regular guests and had dozed off in the parlor. When Emmie Wood, the presiding genius of the ranch, liked his looks, she offered him room and board whenever he wanted it in return for being on hand to squire around such of the current crop of women as were feeling lonely. Some of them, he says, were ripe for the analyst's couch; others were good sports and ready for fun. In any event they all found him a charming companion and he had a wonderful three years.

Sometimes these cross-cultural romances had happy endings. I knew a woman who was working at a hotel in Tahoe and, to do a favor, drove over the mountains to deliver a turkey to the Flying M E in time for Thanksgiving dinner. She arrived along with a blizzard and had to stay for three days. Guests at the ranch consisted of three grandmothers and one man, a manufacturer from Massachusetts. Before New Year's she had married him. They settled in Massachusetts, but Nevada was in their blood and they came back to Carson City to live happily ever after in a big house with a codfish weather vane.

Overseeing and handling all this, and keeping their flocks amused, distracted and out of trouble, demanded a special breed of divorce-ranch manager. It might be a refugee from New York society like Emmie Wood of the Flying M E, or it might be an ex-rodeo rider and horse trader like Harry Drackert at Pyramid Lake, who carried a bullet lodged right next to his liver ever since he disregarded a warning from a man on Virginia Street not to lay a hand on his wife. Harry's wife, Joan, had come to Reno from Maryland with $300, of which $100 went to the lawyer. She got a job as desk clerk on a divorce ranch, and on her first day there the owner disappeared on a gambling toot, a maid was caught stealing jewelry, and a husband holding a gun to his head turned up at his wife's bedroom door. Nothing in the business would ever surprise Joan again.

For all the incidental melodramatics and leering hints in the gossip columns, Emmie and Harry and the rest did a remarkably effective job of providing a friendly, clubby atmosphere far from lawyers and psychiatrists. Days there were spent riding in the hills through the landscape of a John Ford Western, or swimming in summer, skiing in winter. Nights were filled with the neon lights and ringing bells and clanking coins of gambling casinos. In the early 1950s there were few casinos, all fairly small and friendly and reasonably honest.

Gambling only became a big business in northern Nevada when Bill Harrah, recently freed from the

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In 1954, Bobo Rockefeller shed her husband, settled for $6 million and dated local hotel owner Charles Mapes.

bonds of Old King Alcohol and finding himself with all those extra hours in the day to fill, bought up some crooked little operations at the south end of Lake Tahoe and turned them into what was for quite a while said to be the biggest gambling establishment in the world. It was located on the state line 50 miles from Reno, where he could catch the panting but weary gamblers as they struggled over the Sierra from virtuous California, and he provided buses to give rides up to the lake over roads swept clear by his snowplows. It was the beginning of the mass Kmart type of gambling now universal, aimed at the common man and woman instead of just the high rollers who were friends of Bugsy Siegel.

The rise in gambling came just in time to make up for the loss of divorce revenue. American attitudes were changing, and what had once been a sin or a disgrace or at least a defiance of convention was now an accepted part of ordinary life. Unfair competition in places like Alabama and Mexico that offered overnight divorces was followed by liberalized laws across the Union that made divorces on Nevada terms available almost everywhere. The last Reno divorce to merit headlines and pictures in national magazines was that of Mary Rockefeller in 1962. One by one the ranches and lodges catering to the divorce trade either burned down, like the Flying M E, or closed their doors.

It is all ancient history now. Only a few old-timers are still around to tell raucous tales of the glory days of high jinks at Washoe Pines and skinny-dips in the pool of the Bonanza Inn. And when they talk to the youth of Reno about such things, they might as well be talking about the Spanish-American War.

Gambling is now Reno's leading industry. But with state lotteries all over the nation and legal casinos on many Indian reservations, its great days in Reno are probably over. It is a good-sized city now, however, with a metropolitan population of 300,000, compared with 34,000 when I first saw it. It is also a modern city, with modern city problems (crime in the center, sprawl at the edges), a big university and a symphony orchestra. No longer do you have eccentric gambler entrepreneurs like old Raymond Smith at Harold's Club, who used to burst into the middle of the pit and announce he would pay double for any winning bet then on the tables. Gambling is now in the hands of soulless corporations that trade their shares on the New York Stock Exchange and operate on strict business-school principles.

There is still no heavy industry in the region. Instead, there is a proliferation of operations making things like giant masts and sails for racing yachts, metal tops for campers, slot machines, electric trains, vaulting poles, Christmas tree decorations and a secret blend of microcrystalline waxes that will keep fragile objects attached to the wall and safe from earthquakes. The city has just opened what is described as the world's largest assemblage of bowling alleys under one roof.

People have been moving in by droves to escape the smog and the taxes of California, and the biggest little city in the world has turned into one great all-American suburb with its usual shopping malls and its usual complaints ("I planted a couple of mountain aspens in my backyard a couple of years ago so I could enjoy the wonderful autumn foliage, and now the EPA tells me I can't add a room to my house because where aspens grow the ecology is fragile and mustn't be disturbed").

And filled the badman full of buckshot

Fifty miles south of Reno in the town of Genoa, a Dutchman named Van Sickle built a fine stone ranch house in the 1850s. One day, according to local lore, the notorious badman Sam Brown rode up and shot at him six times because, he said, he wanted to have a man before dinner. From drunkenness or incompetence, Brown missed all the shots. Van Sickle went back into his house, got out his shotgun and filled the badman full of buckshot. The grand jury returned a historic verdict—Served him right—and Van Sickle went on to become county treasurer.

In the 1950s his ranch was being run by a big blustery man named Fritz Ruppel, a man who antiqued buildings by firing buckshot into their roofbeams. I was helping him bring in his hay one day and I was passing a bale up to him on his truck when, without warning, he dropped his hooks and began bellowing, "My Bobos! My Bobos! Dong Dong Dee! Dong Dong Dee!" And he leapt off the truck and began rolling around in the stubble while a whole family of wild geese glided in and swarmed around him, the mother goose honking like all get out and the little goslings pecking away at the bits of hayseed on his shirt and jeans. He told me later this was only the latest episode in a story that had begun one day

a few years back when he found a female goose on the property who had run into a barbed wire fence and cut herself cruelly. He took her in, he called her Bobo, he treated her wounds, and he taught her to fly again, or at least he ran along beside her flapping his huge arms while she tried to get her bruised wings back into action. In the process he learned the rudiments of goose language, which he found consisted of endless variations on the two syllables "Dong" and "Dee." Eventually Bobo flew away, but every year, despite all the crushing hereditary weight of goose suspicion of mankind, she came back to the ranch with the great scar across her chest to introduce her family. It was one of her daughters who had now come back with a family of her own.

It is one of my favorite memories of Nevada: there at noon over Sam Brown's grave in the meadow by the tules, with the clean blue empty sky stretching from the pine-carpeted Sierra to the bare knobs of the Pine-Nut Range, and not a sound except the distant wailing of a lovesick cow and Fritz and his friends all saying "Dong Dong Dee" in their varying accents.

At last accounts Van Sickle's ranch was to be subdivided and covered with bungalows for refugee Californians.

A couple frolics at the famous Flying M E divorce ranch, where many romances ended—and many began.

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By Richard Wolkomir

En garde! We seem to be getting the point of fencing

Wielding saber, épée or foil, enthusiasts in increasing numbers are discovering a sport that demands skill, strength—and strategy

Sparring with balletic grace, three-time Olympic competitor Sharon Monplaisir (left) and her opponent, Kari Coley, brandish épées in a practice bout. Women first fenced at the Olympic level in the 1924 games.

"You have to be a little killer, like this girl," says Peter Westbrook approvingly. The 10-year-old's skinny arm shoots out and—*Thwap!*—she drives her foil's tip into her opponent's padded white jacket. "Fencing isn't being nice," says Westbrook.

He should know. It is Saturday morning, when the Peter Westbrook Foundation takes over the New York Fencers Club. Sixty kids, coached by Olympic fencers, are lunging at each other. Many are from the meanest neighborhoods, like the one where Peter Westbrook grew up. But that was long ago. These days, Westbrook is preparing for his last Olympic hurrah. "Right now, it's looking good," he says. At age 44 he is deep into athletic codgerhood. But he is so fit, his fencing sneakers seem to bounce on springs. He is just back from winning the 1995 Pan American Games, another step toward qualifying for an astonishing sixth Olympics, the 1996 games, in Atlanta.

Photographs by Brad Trent

You won't see his picture on Wheaties boxes. At the 1984 Olympics, he won America's sole fencing medal in the last 36 years, a bronze. He holds 13 national championships, an all-time record. But he is unknown on Main Street. That is because he doesn't slam-dunk or triple-Salchow. He slashes at other men with a saber.

It's nasty, but it may be catching on. The United States has always been international fencing's biggest wimp. But now, with Communism's collapse, top coaches have immigrated here from Eastern Europe. And athletes like Peter Westbrook are proving that fencing is not just for Ivy Leaguers. Fencing clubs are even popping up where I live, in cow-intensive Vermont. And so I have come to New York, the country's fencing capital, to delve into this sword thing, which got a grip on my psyche decades ago when I was a small-town cub reporter.

My newspaper's editor, in another life a *New Yorker* poet, had fenced at Harvard. Now, exiled by domestic exigencies to our upstate New York Podunk, he had nobody to play with. And so he trained me, the paper's college-boy apprentice. We practiced at his hillside farmhouse, the blades click-clacking under the maples. Every so often I'd elude his straight thrust or disengagement and zap him, whereupon he would theatrically widen his eyes, his gingery mustache curling up behind his mask. He would clutch his chest and cry out, in fake Gasconese: "I die! By zee blade of a mere stripling!"

Nobody is playing D'Artagnan here at the New York Fencers Club. This is a national powerhouse of the sport. The Peter Westbrook Foundation kids fence here with stretched-rubber-band intensity. For one thing, top coaches, like Columbia University's Aladar Kogler, who built his reputation in Hungary and the former Czechoslovakia, are among the foundation's teachers. One of these kids could be the next Peter Westbrook.

An anxious father, George Harewood, watches his 10-year-old, Ashley, lunge with her foil. A few years back, at his family's church, he says, one of the Olympians who works with the foundation put on a fencing demonstration. It left Ashley with athletic stars in her eyes. Her father sees stars, too: "Kids can travel for competitions to distant cultures, like Greece," he says. "And some win scholarships." Ivan Lee, 15, removes his mask long enough to say he likes saber "because you can hit them on the head." But his father, Desmond, a Brooklyn minister, notes that beneath the bravado lie scholarship hopes, possibly the Olympics. Rosalie Tracy points to her son, Idriss Theophilus. He was so turned on hearing about the Peter Westbrook Foundation classes, she says, he did something extraordinary for him: he rushed to

Swashbucklers, onscreen and in real matches, have long captured the popular imagination. From left: Errol Flynn defies oncomers in *The Sea Hawk*, 1940; spectators throng a Paris exhibition, 1896; a masked Douglas Fairbanks sr. stars as Zorro in 1920.

the library to read anything he could find on fencing.

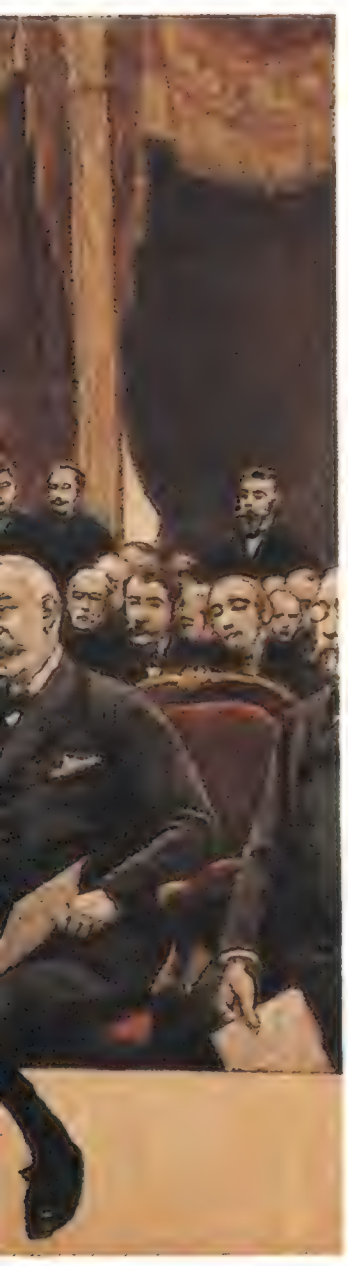
As we watch the kids parry and thrust, Peter Westbrook tells me how he got his own start: "Every Halloween I'd dress like Zorro on TV, but it was my mother who actually got me fencing." He grew up across the Hudson, in the New Jersey housing projects. His mother was Japanese. But her well-to-do Kobe family were angry when she married an African-American serviceman. The couple settled in Newark. When Peter was 5 and his sister was 4, their parents separated. His mother eked out a living assembling television picture tubes. Meanwhile, by age 14, Peter was running wild.

"My mother offered me $5 to try fencing," he says. Bribed, he signed up at his Catholic high school. "I realized I was beating people who'd already been fencing two or three years, and it was fighting, which I liked, but I wasn't hurting anyone, or being hurt," he says. "I told my mother I wanted to quit, but that was to get another $5—after a week I told her the truth, that I loved it."

At first, the aristocratic European sport had seemed alien. "There was nothing like that in my neighborhood," Westbrook says. He was good at track and field, and he excelled at boxing. "Living in the projects, you fight every day—but I discovered that fencing skills are the same as boxing skills." Boxers use their bodies more than most fencers, who rely on their legs and arms. Westbrook turned that to his advantage. "I use my body more, like using body feints to throw an opponent off."

He was so good that he earned an athletic scholarship to New York University. His coach said he should try for the Olympics. He quickly became an American saber phenomenon. But fencing does not financially support even its superstars. And so Westbrook worked as a corporate executive, eventually as marketing director for North American Van Lines. "Of the kids I grew up with, about 5 percent are on drugs right now, and 5 percent are in prison, and 90 percent are dead," he says. "There came a time when I wanted to give something back."

Another high-level competitor at the New York Fencers Club, bond trader Eric Rosenberg, was running a fencing program for kids, hoping to discover new fencing talent. Westbrook wanted to reach out particularly to poor inner-city kids. And so Rosenberg amalgamated his program with the new Peter Westbrook Foundation. To teach the classes, Westbrook recruits his fellow Olympians and top university and Olympic coaches. He also rounds up donations to keep the free Saturday classes going at the New York Fencers Club's vaguely grubby West Side digs. Word of mouth brings some kids. Others are turned on by fencing exhibitions



At the New York Fencers Club, expert swordsman Eric Rosenberg demonstrates the "simple thrust" to an attentive young audience. Rosenberg is committed to nurturing America's next generation of fencers.

at their schools, showing off the sport's three distinct styles—foil, épée and saber.

The saber—Peter Westbrook's weapon—is the flashiest, descended from old-time cavalry swords. Saber fencers charge at each other, blades clanging, slashing their opponent anywhere above the belt. Stiff-bladed épées, blunted dueling swords, score solely with their tips. Duels, at least in France, were fought to "first blood." Since épéeists are emulating duelers, they can score anywhere on the opponent's body, including a toe or a fingertip. The third weapon is the more flexible foil, originally a fencer's practice sword. The foil's target area is the upper body, minus the head and the arms. Like the épée, it scores only with the point.

Fencing does not require bulging biceps, although strength helps. But it does require lightning reflexes, and even faster thinking. Westbrook says the sport blends boxing and chess. That is because fencers master a repertoire of attacks and defenses, in myriad combinations.

Eric Rosenberg shows me a circular diagram representing sectors of the body that might be attacked. Listed for each quadrant is a selection of moves for outmaneuvering the defender's blade to make a hit—or, as fencers would say, "score a touch." Also listed are the defender's countermoves, or "parries," to deflect the oncoming blade. Each parry simultaneously positions the defender to deliver a return thrust, or "riposte." My editor friend had taught me a few of these attacks and parries, like the "beat," in which you whack aside your opponent's defending blade with your own, making room to thrust out your foil to plant the point. If your blade does not reach, you drive it home with a forward lunge. Or you might feint. For example, you beat aside your opponent's blade. Expecting a thrust, he whips his blade back to parry. But—tricky you!—instead of thrusting, you drop your blade under your opponent's and come up on the opposite side, where he is now unprotected.

Kindergarten stuff, I see now. Rosenberg's chart looks like something Einstein might have scrawled figuring out relativity. And my own backyard fencing, I learn, was crude. In Europe, beginners spend up to two years on footwork, before ever picking up a weapon.

I asked all the fencers I met how they got started. My favorite answer came from Viveka Fox, 33, a teacher in Middlebury, Vermont, coach of her local fencing club, and a North Atlantic sectional champion in women's foil. "When I was 12, I went to camp, where my counselor was a fencer," she told me. "I had a monster crush on him." More typical was the engineer who told me he got bumped from one of Yale's athletic teams and started fencing on the rebound. A University of Vermont administrator said he got the bug as a kid in New Jersey,

Richard Wolkomir is a frequent contributor to these pages. His foil, nobly battered, has been ceremonially retired to his attic, along with his old boxing gloves.

glued to the tube watching old Errol Flynn movies.

For some, fencing has been a stepladder out of the slums. "My neighborhood in the South Bronx was a pit," Sharon Monplaisir tells me in New York, as she takes a break from épée practice. At Theodore Roosevelt High School she tried basketball. "But I couldn't dribble," she says. "I tried swimming, but for me it was the hundred-meter drowning." A locker-room fencing notice caught her eye, and a coach, seeing her talent, sent her to the New York Fencers Club and Eric Rosenberg. Monplaisir became the 1988 U.S. national champion and a three-time Olympian in women's foil. Because of fencing, the slender girl found herself with a scholarship to the University of Wisconsin. Now she is competing for a spot on the 1996 Olympic team, this time in women's épée. She plans to retire from competitive fencing in 1997. "But I hope to raise tons of money, to help other kids learn," she says.

Peter Westbrook is officiating a bout. He makes the losing boy salute the winner by saying—teeth gritted—"Thank you, Your Highness." That done, Westbrook tells me: "We have these Hungarian and Ukrainian coaches fighting over these kids." He grins gleefully: "These kids have never been so wanted in their lives!"

They are unlikely to become world champions, however, because the United States is fencing's hinterlands. Top European coaches have told Peter Westbrook that, given his talent, had he been Russian he would repeatedly have won Olympic gold. Upcoming U.S. fencers suffer because of nickel-and-dime financing. They rarely compete overseas. That means they cannot hone their skills against the best fencers, who are European.

Europe is fencing's epicenter because the sport began there. It evolved from the early Europeans' urge to slash, chop and puncture other early Europeans. By the Middle Ages sword blades had diversified, becoming as long as broom handles, or stumpy, or shaped like meat cleavers. Hilts sprouted cross guards, counterguards and knuckle bows, often richly adorned. To find out how these heavyweight swords evolved into today's featherweight fencing weapons, I've consulted fencing historian Nick Evangelista's new tome, *The Encyclopedia of the Sword.* He says that when knights clanked into battle like iron lobsters, swords were basically shell crackers. Swordsmanship came down to a vigorous swing.

Medieval knights did a lot of swinging. Hordes of spectators would watch tournaments *à l'outrance*—to the death. And Evangelista writes that the fighting might not end until the last combatant, "often near suffocation in armor so badly dented it could be removed only with the aid of a blacksmith, was unable to remain standing." Ultimately, with the advent of guns that could shoot through armor, knights shed their now-useless metal suits, but swords were still used for hand-to-hand fights. As recently as the early 1700s, professional swordsmen would fight on English stages for money, audiences cheering every bloody blow.

Swords, meanwhile, had begun an evolutionary spurt around 1500: the slashing sword began giving way to a new, defter, thrusting weapon, the rapier. Some 16th-century rapiers extended six feet, an annoyance on the streets. England finally limited them to three feet. By the late 1600s, the rapier evolved into the lightweight "smallsword," so maneuverable that it allowed new tactics. It also allowed swordplay that actually was play. The unborn sport of fencing awaited only an obstetrician.

Domenico Angelo, born in Livorno, Italy, in 1716, studied swordsmanship in Pisa and in Paris. When he moved to London, the elegant master swordsman became a social lion. His reputation enraged Ireland's top swordsman, a Dr. Keys. Keys challenged Angelo to a public contest, pitting his tried-and-true sword-swinging

Olympian Peter Westbrook helps a saber-wielding student, Chris Frierson, to hone his defensive skills.

Practicing at the Fencers Club, high school student Boris Moyston lunges to plant blade tip on a wall pad.

against Angelo's more refined approach. A crowd gathered in a London tavern to watch. Angelo quickly analyzed Keys' technique, which turned out to be mostly brute force. And so he allowed Keys to attack him repeatedly, while—calmly, gracefully—he parried. When Keys finally exhausted himself, Angelo scored 12 easy hits. After that, Angelo was so sought after by England's upper crust that he opened a school.

Modern fencers, Angelo's progeny, wield blunted weapons. Today's foils, épées and sabers are equipped with electronic sensors that flash lights and sound buzzers at each hit. Fencers protect themselves with padded jackets and gauntlets, and wire-mesh helmets. Fencing has even had a public relations arm, in the form of literature.

In his encyclopedia, Nick Evangelista lists 80 examples of books rife with whistling blades, from the Bible to *Tom Jones, Lorna Doone, Kidnapped* and *The Hobbit.* Of course, swords have also been a movie mainstay. They carry so much symbolic heft, Freudian and otherwise, that even today swords appear onscreen, most recently in Mel Gibson's *Braveheart.*

Evangelista notes that Douglas Fairbanks sr.'s fencing skills—under the tutelage of movieland fencing master Fred Cavens—"improved dramatically" from his first swashbuckling film, *The Mark of Zorro,* in 1920, to *The Iron Mask,* in 1929. Errol Flynn, on the other hand, was "an indifferent swordsman." In fact, in his 1959 autobiography, *My Wicked, Wicked Ways,* Flynn admitted that swords scared him, particularly when hoisted by actors, "because we don't know how to handle ourselves." Anthony Quinn once ran a sword through Flynn's doublet. Flynn had a sword tip rammed into his mouth. And he nearly sliced off another actor's thumb. But Flynn had fencing theatrics down pat. "I don't know much about fencing, but I know how to make it look good," he wrote.

Jose Ferrer studied fencing with Olympic coach Giorgio Santelli. David Niven once accidentally stuck his sword into an extra's leg, which turned out, luckily, to be wooden. "Maureen O'Hara's fencing ability," notes Nick Evangelista, "was superior to that of many of her male contemporaries." Bruce Lee, he adds, borrowed fencing techniques for his martial arts maneuvers, "simply substituting his arm for a foil." The Hollywood actor who fenced best was Basil Rathbone. Even space aliens fence: What would *Star Wars* have been without Darth Vader's eerily humming "light saber"?

Fencing has had its own "dark side of the Force." At the 1982 World Championships, a foil's blunted tip broke off; the blade penetrated a Soviet fencer's mask and pierced his brain, killing him. In 1983, broken blades killed a British épéeist, stabbed in the throat, and a West German foil fencer, struck through the heart.

These tragedies reveal the underlying reality. Modern sport fencing, which began with Domenico Angelo in the 1700s, relies on blunted tips. It looks as graceful as dance. But unblunt the tips and fencing instantly reverts to its evil alter ego: the duel. European-style dueling is rooted in France. One forebear was "judicial combat," or holy ordeal. As Saint Augustine explained: "During the combat, God awaits, the heavens open, and He defends the party who He sees is right." Dueling also was rooted in knightly combat. Blue bloods fought to the death for the exhilarating fun of it. It was a short step to duels.

Dead in duels: 40,000 blue bloods

Bloodletting became a mania. Evangelista cites Renaissance astronomer Tycho Brahe, who lost part of his nose in a duel and afterwards wore a copper nose cover. From 1600 to 1789, Evangelista says, 40,000 aristocrats died in duels. One French duelist, the Chevalier d'Andrieux, skewered 71 men by age 30.

German dueling was the most virulent. In 1695, in Berlin, a 60-year-old duelist was publicly hanged, along with his victim's corpse. But by the late 1800s, writes Kevin McAleer in *Dueling: the Cult of Honor in Fin-de-Siècle Germany,* German monarchs, while publicly denouncing the practice, tolerated it. That was because, in Germany, dueling was rigidly limited to the upper classes, gluing the caste together to maintain its privileges. Commoners could not "give satisfaction."

German dueling reached its golden age at the turn of the century and lingered until World War I. Catholics had been forbidden by Rome to duel. Jewish students, shunned by dueling clubs, formed their own and developed a reputation for ferocity. Mostly, however, dueling remained a marker for blue blood. Social Democrat August Bebel quipped: "If the gentlemen from the so-called upper classes want to bash in each other's heads or shoot each other down with pistols, fundamentally we can have very little objection to it. The more they prac-

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tice the business of self-obliteration, the better for us."

England banned duels in 1844. However, by the 1800s, France had invented dueling "lite." The revolution had ended noble prerogatives. Any French tailor or butcher could give satisfaction. Blue bloods had felt compelled to fight to the aristocratic death; commoners felt no such compulsion. With caste not at issue, French duels did not have to be lethal. By the 1890s, Frenchmen were fighting between 400 and 500 duels a year. However, the death rate was about zero. Instead of the German preference for heavier swords or, later, pistols, French duels were fought with épées. Unlike many German duelists, Frenchmen usually were expert fencers. And since duels were fought to first blood, even a scraped knuckle would satisfy everyone's honor. German duelists sneaked into the woods; usually only one walked out. French duels were fought in public places, as spectacles, preferably with press coverage.

Journalists, members of my own profession, were the most frequent fin de siècle French duelists. Some newspapers, like *Le Figaro*, even set up private fencing salons to keep their newshounds in fighting trim. And that got me to brooding upon a slight to my own honor.

Do not think I disliked Dale Rodgers, for the opposite was true. He told me he and his twin brother had been spindly teenagers. But they loved sports, especially football. "At that time, I probably didn't weigh a hundred pounds," Dale said. In his first high school game, he was knocked cold. Limping glumly down a school corridor, the ex-gridironist heard clacking. Through a crack in a door he saw kids fighting with swords, watched over by a coach. He was hooked. He went on to become a high school fencing all-American and attended college on a fencing scholarship. Fencing made him a member of the 1972 U.S. Olympic pentathlon team. He became an assistant fencing coach at Columbia and the coach at Dartmouth College. Now he is the engine behind the growing Vermont Fencing Alliance.

One evening, I mentioned to Dale that I had not lifted a foil in 15 years. Why didn't he and I fence a few points? He regarded me dubiously. "Well, you could attack," he said, finally. "And I could just defend."

An insult! Am I to be merely parried? Dismissed as a beginner? Like one of Peter Westbrook's 9-year-olds, nervously clenching a foil for the first time?

My fencing career passed before my eyes. I saw myself fencing shirtless, because my editor friend said it taught the importance of parrying. I recalled the Saturday morning I toted my foil through our Vermont town, headed for a bout, when a grinning stranger shouted across the street: "Do you need a second?" And the afternoon a passing car slowed as a friend and I fenced in my driveway, the white-haired couple inside staring. I heard the woman ask: "Should we call the state troopers?"

I had no choice but to challenge. Dale was four years younger than I. But Peter Westbrook had told me, "I just beat a guy at the Pan American Games who's a better fencer than I—speed and youth don't outweigh age and treachery!" Dale and I met in an empty ski-touring center. It was a dull day, and cold. I whisked my foil through the air a few times, to get back the feel. My wife was officiating, for some reason looking bemused. I had heard her telling Dale on the telephone, "Well, he has not fenced in a long time, but I guess he's in OK shape."

Old age and treachery! We raised foils in salute, a bout's ritual start. Were it not for these blunted tips! He hoped to encourage me to get back into fencing, I knew. He would hold back. I would pretend to be unsure of my moves, which would be easy, all things considered. I would draw him to attack. Prepared, I would parry. Lightning fast, I would counterattack. *Thwap!*

"Fence," my wife ordered, in her role as official. Immediately, he thrust. I instinctively whipped my blade to parry his attack, planning to follow with a bullet-fast riposte. I thought, Ha! Not so slow as you expected! But my blade parried only air. He had feinted. Now his foil pointed toward my chest's unprotected side. *Thwap!*

I clutched my padded jacket. My eyes widened. If I'd had a mustache, it would have curled up behind my face mask. I heard an inner voice, and it cried: "I die! And by zee hand of a mere stripling!" But what did it matter? I had challenged. I had fought, although perhaps not brilliantly. But my sacred honor! It was intact!

Seven-year-old Tess Finkel (seated) and sister Kelsey, age 9, are among Westbrook's promising protégées.

The scenic Salton Sea draws migrating birds from far and wide, but some species are now at risk there.

Meanwhile, rising salinity and pollution have ruined attempts (like one above) to use it for popular resorts.

By Robert H. Boyle

Photographs by Chad Slattery

Life–or death–for the Salton Sea?

This huge California lake was a haven for birds and fish, and aimed to be a paradise for man—but chemicals and salt may do it in

You half expect to hear Captain Kirk say, "Beam me down, Scotty. This is the strangest lake I've ever seen." Illuminated by a G-Class star and flanked by Martian-like mountains with ancient dry washes, the reddish brown lake covers 380 square miles of a deep desert bowl. Mud volcanoes bubble along its southeastern shore, the rotten-egg stench of hydrogen sulfide pervades its backwaters, and yet hundreds of thousands of birds, many strange to the eye, feed along the edges of the lake or bob on the open water. And there on the western shore lies the outline of a lost city.

This bizarre body of water is not on some strange planet in a distant galaxy. It is the Salton Sea in the southeastern corner of California near the Mexican border; the lost city is Salton City, laid out for 40,000 people and never finished.

That was in the late 1950s, when the Salton Sea was supposed to become the Golden State's great new playland, a whole new concept of Southern California living, with an "alluring combination of the desert and the sea." M. Penn Phillips and other developers of Salton City bought 19,600 acres that they subdivided on paper for house lots, shops, schools, parks and churches. They spent $1 million on a freshwater distribution system with 260 miles of water lines. They put in power lines and 250 miles of paved streets in elegantly contoured

As catches declined, motels and other local businesses that catered to sport fishermen began to go under.

Partial view of Salton City from the western shore shows the original development's ambitious street plan.

patterns, with names like Sea Kist Avenue and Shore Jewel Avenue. They built a yacht club and lavished $350,000 on an 18-hole golf course. Developer Ray Ryan, a big-time gambler with reputed mob connections, bought land on the other side of the sea and sank more than $2 million into a resort he named the North Shore Beach and Yacht Club.

While real estate salesmen gave the pitch to those who came down from Palm Springs or Los Angeles to look over lots or to party, visiting celebrities—Frank Sinatra, Jerry Lewis and Linda Darnell—added to the hype. Even so, construction crawled in the desert heat, and in the late 1960s sales went nowhere. Unexpected heavy rains kept raising the level of the sea and flooding shoreline homes and buildings. A steadily growing concern set in about the water's brownish tinge, about pollution levels and the increasing salt content.

Today Ryan's North Shore Beach and Yacht Club is deserted, its breakwater submerged and its swimming pool crumbling. Across the water, although chamber of commerce brochures still welcome folks to "The Fabulous Salton Sea . . . Sea, Air and Sun for Healthy Desert Fun," visitors northbound on Route 86 to Salton City find not sailboats and bikini-clad blondes on water skis, or docks packed with pleasure boats but, instead, a scattering of houses, modest RV parks, defunct motels

Growth ceased as the sea's woes grew more evident; today, 19,000 lots are still for sale—with few takers.

The sea's premier defender, Norm Niver, lives there year-round and serves on the commission to save it.

and empty lots on streets often shaggy with tall grass.

The Salton Sea has been described as a "mistake of man and perhaps of nature." But it is in fact a perplexing and spectacular example of a collaboration between the two with unexpected results. The surface of the sea lies 227 feet below the level of the ocean in one of the hottest, driest desert sinks in the world. It came about by accident 90 years ago. That was when the Colorado River violently broke away from its southerly course toward the Gulf of California, and flowed west, then north, from Mexico, creating the Salton Sea.

The new sea was 45 miles long, 17 miles wide and about 80 feet deep. After engineers got the Colorado under control, the sea should have dried up through evaporation. It has no outlets and lies in an area with only 2.3 inches of rain a year and temperatures that reach 120 degrees F. But year after year it has been sustained by drainwater from the 500,000 acres of heavily watered and fertilized growing fields of the Imperial Valley, one of the most fruitful desert irrigation projects in history. In the 1920s the sea was officially designated as the Imperial Valley's catch basin. Agricultural wastewater carries various nutrients, including nitrates, as well as pesticides, potentially toxic levels of the element selenium, and four million tons of salt leached from the soil every year. The sea began life as the largest freshwater lake in California, with rainbow trout originally tumbled into it by the Colorado. Today it is 25 percent saltier than the Pacific Ocean, and getting saltier.

Miles of canals lead Colorado River water through the Imperial Valley, feeding into the Salton's two major tributaries, the Alamo River and the New River. Both flow north from Mexico, receiving drainwater along the way. Considered the most polluted river in the United States, the New glugs through Mexicali, Mexico, a city of more than 750,000 people that dumps in raw sewage, inadequately treated sewage, leachate from landfills, and industrial and slaughterhouse wastes, as well as a visible assortment of trash, toilet paper, dead dogs and phosphate detergents. In fact, most of the bacteria from Mexico seems to die off before its waters reach the Salton Sea. But the appalling condition of the New River serves to stigmatize the sea.

By reputation, the Salton Sea has become a kind of *mer noire*, the marine version of a Hollywood *film noir*. Its southern approaches, in their own way, are as unsettling as the desolation on the western shore or at Ray Ryan's North Shore Beach and Yacht Club. Anyone heading

Robert Boyle has used his pen for years in defense of American waters, notably the Hudson River, beside which he lives. This is his first article for SMITHSONIAN.

Erratic rise of water level can make living precarious along sea's shoreline (top). Above left, David Barrett stands in center of the over-60 Rat Pack. At right, winter "snowbirds" play on the grassless golf course.

north through the Imperial Valley is overpowered by the smell of fertilizers and cattle feedlots. The landscape is flat, composed of green rectangles defined by drainage ditches. Bales of alfalfa as high and long as an aircraft carrier's deck are stacked along the roads. At the sea's southern rim, geothermal energy plants bear signs, scary if common in this environmentally conscious state, that read: "Area contains chemicals known . . . to cause cancer, birth defects, or other reproductive harm."

Despite a large amount of effluence, the sea was for years one of the greatest fishing spots in California, and has long been one of America's great birding spots. It is a critical station on the Pacific Flyway, and a nesting, feeding and resting ground of international importance, with birds coming from many parts of the world. The sea is listed as a hot spot on a video game called "Gone Birding"; birders flock to its shores, listing their sightings on clipboards maintained at ornithological sites. At least 380 species have been reported, a number exceeded in North America only by the Texas coast in spring. Some are threatened or endangered.

"As many as 5,000 brown pelicans occasionally spend the summer on the sea," says biologist Bill Radke of the U.S. Fish and Wildlife Service, who, until recently, was stationed at the Salton Sea National Wildlife Refuge. "About a third of the world's population of Yuma clapper rails depend upon its wetlands, replenished by irrigation drainwater from adjacent farmlands. The sea

provides the only inland nesting sites in the United States for gull-billed terns and provides three of only five nesting sites that exist in the Western U.S. for black skimmers."

In recent years, though, there have been increasing signs of trouble. Early in 1992, Radke was appalled to see a number of eared grebes stagger up on shore to die. Many were so disoriented that they stood still while gulls tore into their flesh and began eating them on the spot. This continued well into March, until the final death toll rose, by conservative estimates, to 150,000 grebes. Radke helped collect 40,000 carcasses. Necropsies ruled out infectious disease as the cause of death, but the tissues of some of the dead birds contained three times more selenium than that of grebes he had tested at the Salton Sea three years earlier.

Selenium is a mysterious, sulphur-like element, deposited by prehistoric volcanic eruptions. It is found in many dry parts of the West, and when seleniferous land is irrigated, selenium can be carried into a watercourse. Though it is an essential trace element for growth in animals and humans, there is a narrow tolerance margin between beneficial and toxic doses. As little as two parts per billion in water can render aquatic vegetation and invertebrates hazardous to birds that eat them.

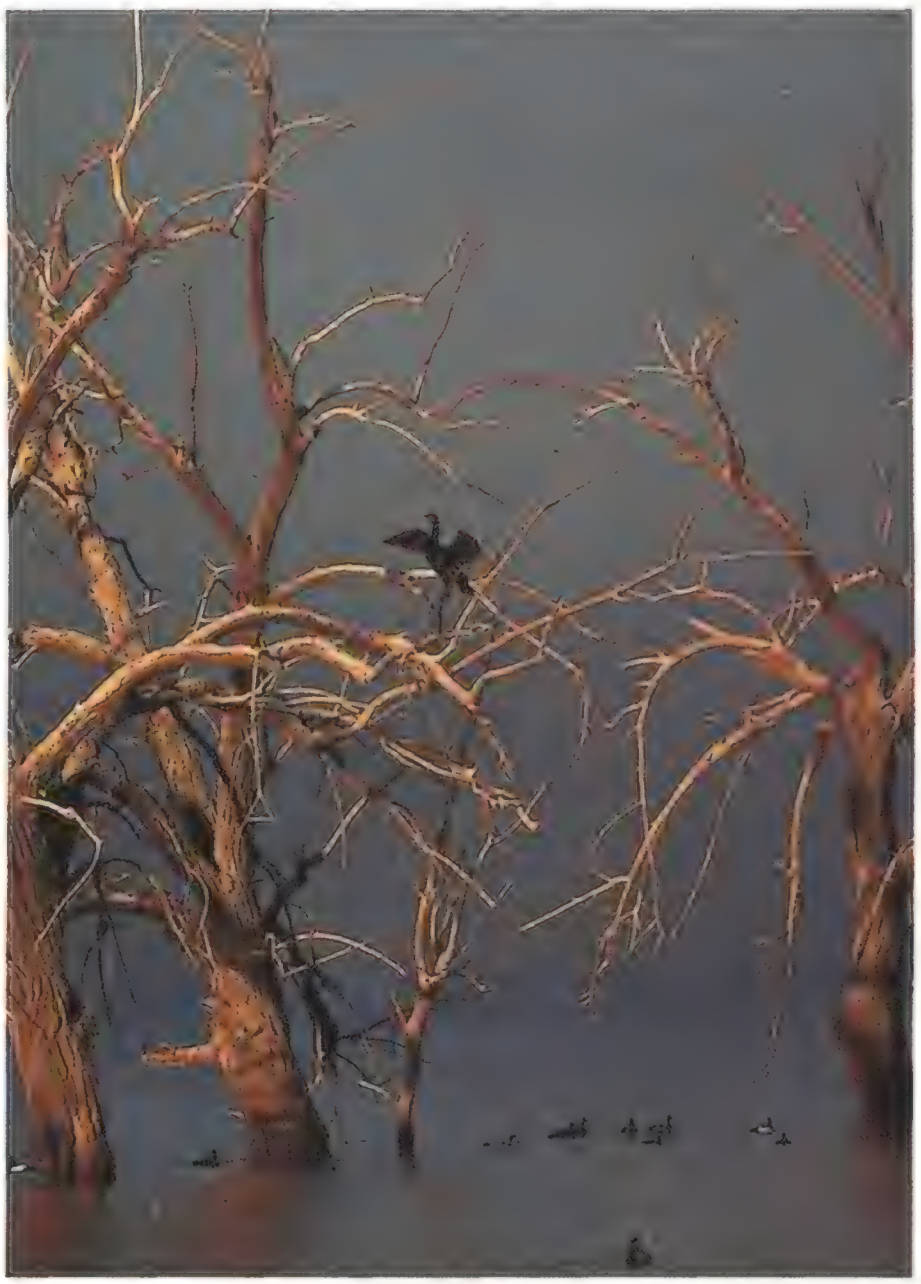
At present, the selenium level in Salton water is only one part per billion—not yet dangerous. But at the sea's silted bottom, the level ranges from 200 to 2,500 times higher. Pile worms live in the silt and are eaten by fish, which in turn are preyed on by fish-eating birds such as grebes. In the winter of 1994, another 10,000 to 20,000 eared grebes died at the sea after behaving in the same strange fashion as the birds Radke had observed in 1992. The exact cause is not yet known. Stuart Hurlbert of San Diego State University believes that toxic phytoplankton is responsible, and recent studies reinforce this view. But in 1994 Joseph Skorupa, a biologist with the U.S. Fish and Wildlife Service who has been working on selenium contamination elsewhere in California, pointed out that "virtually any time birds are exposed to above background concentrations of selenium, as they clearly are at the Salton Sea, the potential for increased susceptibility to disease exists."

Until recently, almost nothing was really done to try to end problems affecting the sea. This is partly because they have evolved so slowly and partly because they involve conflicting claims to water-sharing in the desert; in a prime agricultural area, such claims will clearly be difficult and expensive to rectify. But the threat of selenium and effluents to bird life has helped draw attention to the sea's multiple troubles.

Its water level tends to rise erratically, damaging the little towns that cling to its western shore, where waterfronts are constantly eroded and trees are destroyed. In the village of Desert Shores recently, the Imperial Irrigation District had to bulldoze a dike into place but still found itself obliged to buy up a few waterfront lots rather than risk lawsuits. For years a successful saltwater fishery, the sea may soon be so salty that even ocean fish won't survive in it. Rich in nutrients from Imperial Valley drainoff, it often has a red-brown algal bloom. Even worse, on bad days—mostly in summer—when the wind is right, the stench of the sea is said to reach 50 miles, all the way up to Palm Springs.

Fortunately, this unusual sea has an unusual champion. He is Norman E. Niver, a 66-year-old musician who now and then used to play bass for his actor friends Alice Faye and the late Phil Harris. "Phil liked the sea," Niver says, "but Alice thought it was a toilet bowl." Niver, a compact, 239-pound, gray-haired bundle of energy, and his wife, Connie, a bar manager, live on the water in the failed resort center of Salton City. They bought their house in 1977. Lots were already cheap and, at as little as $2,500 per quarter-acre, are cheaper still today.

The Nivers and some 5,000 other folks, including



Trees die when inundated by saltwater, becoming fine perches for cormorants and other fishing birds.

Illustration shows sea with its connecting canals and streams. An ill-advised cut in the Colorado River let floods (broken lines) rush west and north in 1905 toward the then-empty basin, 278 feet below sea level.

flocks of "snowbirds" who from October to March migrate to trailer and RV parks in the three or four towns beside the scenic sea, constitute a close-knit, convivial community heavily sprinkled with retirees. They are attracted to tiny Desert Shores, Salton City and Salton Sea Beach by bargain-basement prices, an almost frontier-like camaraderie and a beakerful of the warm South. (Space for trailers and RVs ranges from $150 to $210 per month.) This is pancake breakfast country, given to pickup classes in painting and ceramics, "Golden Girls" amateur shows, Easter egg hunts, and brisk rounds on a nearly defunct golf course.

"Let's face it," says David Barrett, 73, "by golf course standards it's a wreck, but it gives a lot of people pleasure." Like a good many snowbirds, Barrett, a World War II bomber pilot from Vancouver, British Columbia, is a Canadian. He is also the leader of an over-60 group called the Rat Pack whose members regularly bang around the rugged desert nearby on motorcycles. Indeed, at the seaside, wheels rather than water seem to provide most of the excitement. The highlight of the winter season is Treasure Trails, an event in which hundreds of people blast off into the desert in dune buggies, pickups, motorcycles, jeeps and "rails" (cars with no sides) in search of 175 or so buried treasure chests artfully hidden by the event's sponsors.

Barrett, who has been coming back to the sea for 15 years, says "There's no necessity to put foot in the water." Every year there have been rumors of plans to fix up the sea, he says, but he doubts anything will happen in his lifetime. He is philosophical about it, perhaps in part because "if the sea were clean, this place would be another Palm Springs, and goodbye to us all."

Norm Niver also defends the sea for its virtues and tries to overlook its faults. The only drawback to living by the sea Niver will admit to is his air-conditioning bill. With summer temperatures that hit 117 in the shade, it costs $300 a month to cool the house down to 80, and then he has to keep wiping the condensation off the windows. But he is a year-round resident, a birder and a fisherman, and he does not take the condition of the sea philosophically at all. Even though health officials have warned since 1986 that no one should eat more than eight ounces of any Salton Sea fish in a two-week period, and that women of childbearing age and children under 14 should abstain completely, Niver regularly eats the orangemouth corvina he catches. "They're delicious," he insists, adding with a grin that he also fed "tons" of corvina to his cat Charles, who died a couple of years ago at the hoary age of 19.

Niver's immediate fear is that increasing salinity will put an end to the fish, with reverberating effects on some 60 species of fish-eating birds that use the sea. In the 1960s and '70s, the Salton Sea was one of Califor-

nia's most productive sport fisheries, with huge schools of corvina, some weighing up to 32 pounds. Now, Niver admits, the number of corvina has dropped and the fish are generally on the small side, 4 to 10 pounds. Though thousands of Californians still camp out in the state recreational areas along the eastern shore, anglers don't use the sea in anything like the numbers that they once did. On the western shore, the few motels that once housed them are abandoned. Experts say that if the salinity continues to increase at its present rate of about 0.8 parts per thousand per year, in less than ten years almost all fish will be gone.

By 1992 Niver's never-ending warnings about increasing salinity helped goad local politicians into setting up the Salton Sea Authority to improve water quality. "He's been a great help," says Brad Luckey, an Imperial Valley farmer and county supervisor and one of the eight directors of the authority. Luckey put Niver on the Imperial County Planning Commission and last year named him the very first appointee to a brand-new Citizens Advisory Committee to the Salton Sea Authority.

Over the years, according to Niver, there has been little or no support from any major environmental group. Gary Polakovic of the Riverside *Press-Enterprise* reports criticism of environmental groups like the Sierra Club and the Audubon Society for doing nothing about the plight of Salton Sea wildlife. Niver adds, "They apparently think that if they get involved here, they'll lose on other water issues in the state."

It is clear that the sea's problems will not be solved any time soon. They are the product not merely of greed and neglect but of geology. The sea, the Coachella Valley to the north, and the Imperial Valley with its 500,000 acres of irrigated fields to the south, all sit in a vast depression not unlike a serving platter, known as the Salton Sink. Thirty million years ago the sink was part of the Gulf of California, the terminus of the Colorado River which rises in the Rockies. The river got its name, Rio Colorado—Red River—from the loads of brick-colored silt it carried on its way down to the gulf. The river's silt, as folk used to say, was "too thin to plow, too thick to drink." Until 1936, when Boulder (now Hoover) Dam was built to regulate the Colorado's flow, the river carried 160 million tons of suspended sediment a year past Yuma, Arizona.

As the ground leveled and the river slowed, approaching its delta at the Gulf of California, the suspended sediment—from silt to rocks—kept settling out. Periodically the buildup of sediment blocked the river's path to the delta. When this happened and the river exploded in full flood, it would flip like a loose garden hose to the west and, following gravity, pour down into the Salton Sink.

Whenever a new wall of sediment blocked the river's path into the sink, the Colorado would flip back east to its original course to the delta. Flip-flopping over the ages, the Colorado sluiced into the sink often enough to create a well-worn channel and a series of huge Salton Seas, each of which eventually evaporated when the river stopped flowing into it. In some places in the Imperial Valley, the sediments, layered like stacked pancakes, are 12,000 feet deep. Anyone who has ever won-

Battered bilingual sign warns people to keep clear of the filthy New River where it flows north to the sea.

The Central Main Canal near El Centro discourages citizens from tossing in tires and old furniture.

Brad Luckey, an alfalfa farmer, is a director of the commission set up to solve the sea's water problems.

dered what happened to the earth and rock that used to be in the Grand Canyon, should wonder no more: a fair amount lies deposited in the Salton Sink.

The last of these prehistoric Salton Seas, named Lake Cahuilla after a local Indian tribe, dried up 400 years ago. A hundred miles long and as much as 35 miles wide, Lake Cahuilla left a bathtub ring of calcium carbonate and mollusk shells on the cliffs, more than 200 feet above the Salton Sea today. The bottom of the present sea lies 278 feet below sea level, only 4 feet shy of the lowest point in the United States, the bottom of Death Valley.

The idea of irrigating the valley with Colorado water and farming the salty desert had been around for years. But nothing came of it until 1900. That year, one Charles Robinson Rockwood of the California Development Company met with George Chaffey, a self-educated irrigation engineer from Canada. Chaffey and his brother William had already built irrigation settlements near Los Angeles, so Rockwood proposed that they join forces to develop the southern half of the Salton Sink for agriculture. The soil was deep and rich; because of the year-round growing season, farmers could harvest two crops and multiple cuttings of alfalfa a year. The Southern Pacific's main line passed nearby so that fresh produce could be rushed East in winter at high prices. The sink could be irrigated by a gravity-flow canal from the Colorado River, which flowed into Mexico only 50 miles to the east and at a level several hundred feet higher than the sink's floor.

Then as now, shifting Sahara-like sand dunes lay between the river and the sink in California. There were no dunes just south of the border, so Chaffey decided to run a canal through Mexico using the Colorado's old channel to the sink. The canal turned north into the United States east of Mexicali. From there the channel, now known as the Alamo River, led almost straight north. Like a true promoter, Chaffey grandly christened the southern half of the sink the "Imperial Valley," and in May of 1901, Colorado River water began flowing into it. In a few years the valley had 700 miles of irrigation ditches. Settlers piled in, homesteading federal land or buying it outright from the railroad. To get irrigation water, they had to buy stock in water companies controlled by the Imperial Land Company, a front for Chaffey and Rockwood's California Development Company. "Cost of water stock averaged $22 a share—$3,520 for a farm of 160 acres," David Lavender notes in *California, Land of New Beginnings.* "Imperial Land was most obliging about selling this stock on credit, taking as security a mortgage on the purchaser's land."

By 1904 there were 100,000 acres under irrigation. Then silt blocked up the head of the canal. Water delivery to farmers was all but cut off. Lawsuits loomed. In the fall of 1904, the California Development Company made a cut in the river to bypass the blockage. During the spring floods of 1905, the Colorado, completely out of control, rushed through the cut and surged on into the Alamo River, its old overflow channel, then plunged on into the New River. Digging into the soft soil, it created a 28-foot-high waterfall, scouring out the river's channel to a width of a quarter-mile.

Birds and scientists flocked to it

For nearly two years the great river continued to pour through the Imperial Valley where impromptu dikes and levees partly protected the agriculture. Most of the water rolled on north into the deepest part of the sink. It was not until February 1907 that a work force of 2,000 laborers, recruited from six Indian tribes, and 3,000 railroad cars of rock and gravel finally succeeded in turning the Colorado back toward the gulf. This desperate engineering feat was hailed as a victory of capitalism over nature. In 1911 it inspired a book, *The Winning of Barbara Worth* by popular novelist Harold Bell Wright, and in 1926 a movie version starring Ronald Colman, which marked the film debut of Gary Cooper. But it cost the Southern Pacific $3 million.

This new Salton Sea soon attracted its first resident birds, and a flock of government scientists who came to

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document evaporation rates. Evaporation caused the sea to shrink. It is only 35 miles long by 15 wide. But it did not dry up as expected, because, to prevent a killing buildup of salts in the soil, drainwater was still being flushed into it from the irrigated fields of the expanding Imperial Valley. In 1928, Congress called for construction of the Hoover Dam and an irrigation canal from the Colorado to the valley, this one entirely within the United States, thus the rah-rah name "All-American Canal."

Besides salts and selenium, Imperial Valley drainage carries high levels of nitrogen and phosphorus, which promote a superabundance of phytoplankton, including the algal dinoflagellates that help turn the water reddish brown and give off an awful stench after they die and decompose. But in dealing with all this, the needs of agriculture, a politically powerful force in California, came first. The Imperial Valley is a gold mine now worth something like $1 billion a year to the state's farmers. The salts would have been deadly to farming; they didn't seem to do much harm in the sea. And for years the California Fish and Game people found ways to accommodate to salt. By the late 1920s, increasing salinity had done in the rainbow trout and other freshwater fish that washed in with the flood. By 1950, when the sea's salinity was already equal to that of the ocean, state biologists began netting whatever they could in the Gulf of California and dumping the catch in the sea. A few species caught on big, most notably the voracious orangemouth corvina (*Cynoscion xanthulus*), and the little gulf croaker (*Bairdiella icistia*), on which the corvina preyed, which was why, for several decades, the now-scorched sea was one of the great draws in California for poor man's fishing.

In recent years the U.S. Geological Survey and the Fish and Wildlife Service have released joint studies conducted in response to concern about drainwater contamination that could "pose a threat to human health and to the survival of fish and wildlife resources of the Salton Sea area." One study concluded that "drainwater contaminants, including selenium and DDE [which results from the slow decomposition of DDT], are accumulating in tissues of migratory and resident birds that use food sources in the Imperial Valley and Salton Sea. Selenium concentrations in fish-eating birds, shorebirds . . . could affect reproduction." Waterfowl and fish-eating birds in the Imperial Valley might be having troubles because of DDE. High concentrations "were found in birds feeding in agricultural fields on invertebrates and other food items."

Because the use of DDT was banned in the United States in 1972, it was believed that DDE should have disappeared by now, but it comes from pre-ban applications of DDT in the Imperial Valley. "The stuff is simply not breaking down here," Radke says. "It's a different story in the East, where there's a lot of rainfall, but out here DDE seems to sit forever. Significant eggshell thinning is a problem with every fish-eating bird at the sea—all the egrets, night herons, great blue herons and black skimmers. Great blues are down by 95 percent."

Little can be done about the DDE. Whether something can be done about the amount of selenium coming in with the Colorado River irrigation water is another question, and one that will grow hotter as more and more birds are affected.

The most straightforward problem seems to be salinity. Early in 1994, the Salton Sea Authority held its first symposium on the topic. Since then two solutions have been studied. One involves switching more fresh water into the sea from the Colorado River in years of high flow, while simultaneously siphoning off saline water from the sea and piping it 45 miles south to the Laguna Salada in Mexico, a plan that would need the agreement of the Mexican government. Estimated cost $110 million. Another is to build a dike to seal off one end of the sea, keeping it as a saline drainoff from the Imperial Valley while maintaining a freshwater flow into the other part. Estimated cost $100 million.

The authority had $10 million to spend on exploring solutions and agreeing on one. It hopes to come up with a decision by this July. Its members represent both the Imperial County and Riverside County, the two counties that enclose the sea. It is understood that unless they can agree, no help will be coming from the state or from national environmental groups. "Unless we are willing to stand up and put our money where our mouth is, nobody in the local, state or federal government is going to care," says Brad Luckey. "If we don't go get rid of the salt and keep the fishery alive, then we've lost the sea."

The infamous New River, silvered by late afternoon sun, winds through rich irrigated fields to the sea.

By Joseph Harriss

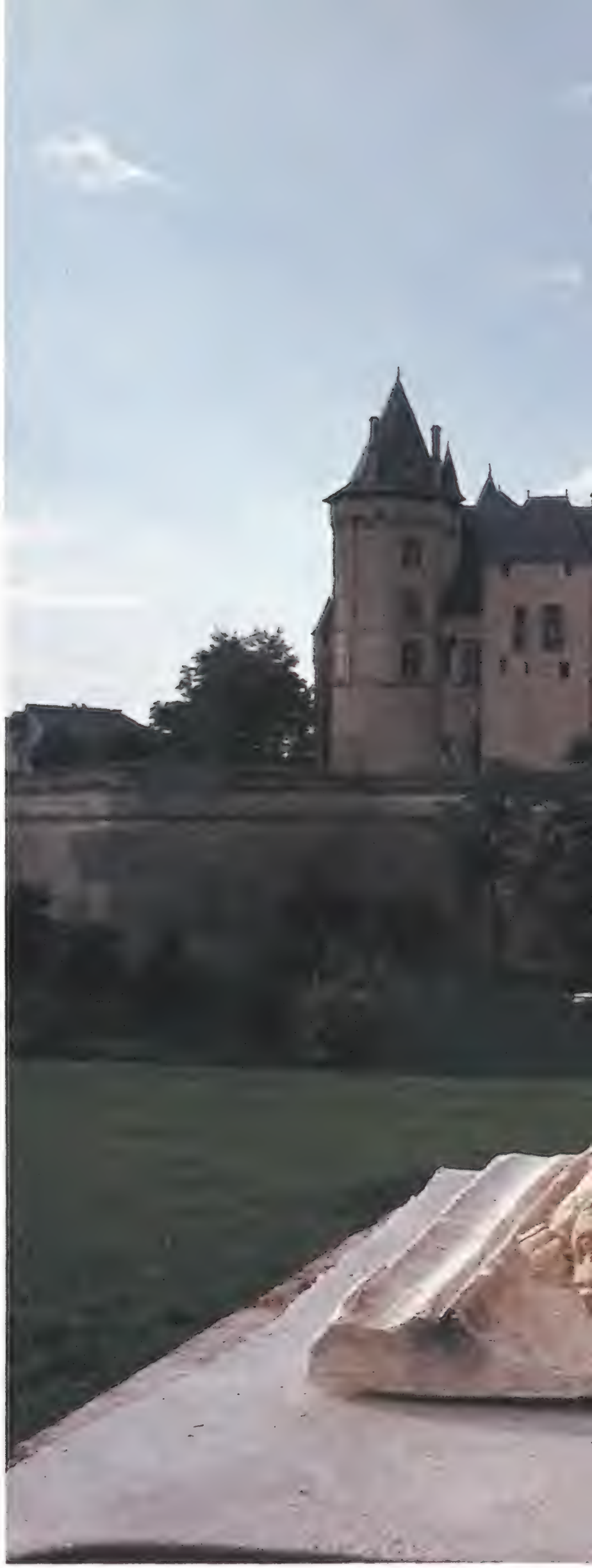
'I owe them a lot; they taught me the love of work'

From boilermaking to fixing up an angel's wing, Les Compagnons hone marketable skills in a medieval brotherhood brought up to date

When he reflects on it, Jean Wiart still seems astonished by a discovery he and his group made in the New World. "We suddenly realized," he says, "that there was no group in this big country that could do what we have done." What he does is things like renovating the Statue of Liberty's huge, 13-foot bronzed torch with its golden flame. Or fashioning an extra-tall steeple for Manhattan's Fifth Avenue Presbyterian Church, not to mention restoring the city's 2,900-pound *Civic Fame* statue atop the Municipal Building. It was Wiart's people who repaired the splendid, copper-domed Borough Hall in Brooklyn, New York. Lately, they also have made decorative wrought-iron gates and stair railings by hand for some of the country's fanciest homes, among them Chez Ralph Lauren and Chez Madonna.

Wiart's team does such things so well that he has won awards from the likes of New York's Art Commission, the Classical America Society, and the National Trust for Historic Preservation. A self-effacing but supremely skilled metalworker from eastern France, he has a simple explanation for why he and his small team of craftsmen, based in Paterson, New Jersey, have succeeded so well in this country within a single decade. "Here in America it's unusual for talented young people to choose work with their hands," he says. "My people and I are experts at our craft, because we are all products of France's best apprentice program."

They are in fact *les compagnons* (the companions), spiritual descendants of a French craft tradition many centuries old. As such they are the heirs of the rigorous, fa-



Pascal Pichery, 16, painstakingly brings his tools to bear on an elegant frieze from a chateau in Saumur.

An apprentice stonecutter, he has recently begun
a training period that will probably take six years.

Freelance mason Patrick Kalita shows off ceremonial Compagnon cane and his hand-sculpted stone Ferrari.

In an 1848 painting, Bordeaux Compagnons give an apprentice a send-off for his working Tour de France.

natically demanding craftsmen who, as members of secretive medieval guilds, festooned France with its crown of cathedrals and chateaus. Along with the redoubtable French Academy, Les Compagnons are one of the rare institutions of ancient France to have survived revolutions, the Terror, communes, religious persecution, Vichy secret police and, perhaps most remarkable, all sorts of modern time-and-motion studies.

These lovers of *la belle ouvrage* literally worship manual work. To hear them tell it, they jump out of bed every morning rubbing their hands with relish at the prospect of another hard nut to crack. "For us it's never a chore to go to work," says Serge Mory, a young Compagnon carpenter in Paris. "The tougher and more complex the problem on the job, the more we look forward to solving it." Some say they're the world's finest craftsmen.

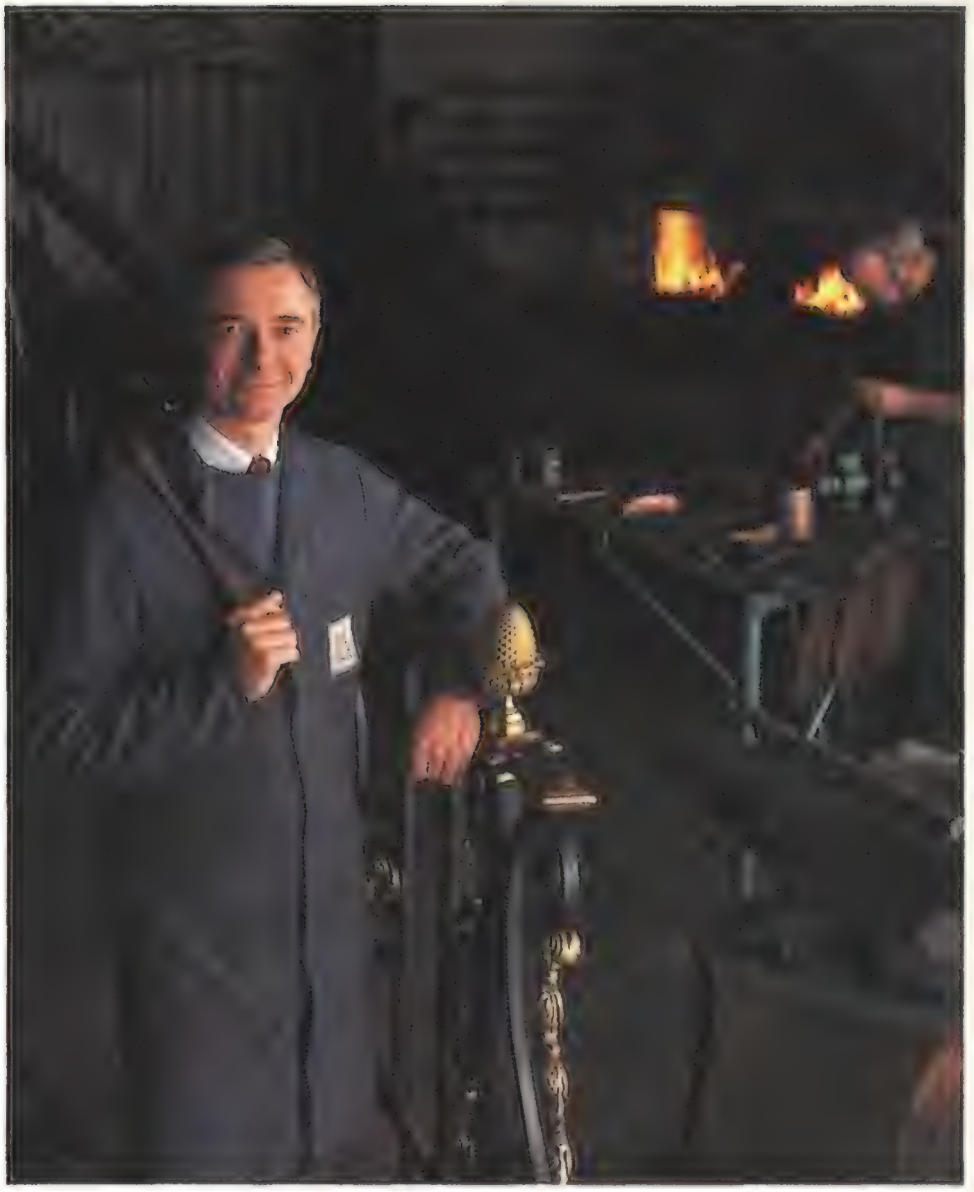
Their professional ancestors, stonecutters and carpenters who practiced the royal art of construction, helped build some 80 cathedrals, 500 large churches and tens of thousands of parish churches from about 1050 to 1350. Later on—a certain July 14, 1789, to be exact—a band of Compagnon carpenters at the Bastille put together a sturdy wooden bridge over the moat so rioting Parisians could storm it.

With the advent of industrialization in the 19th century, traditional trades changed radically, often leaving the Compagnons caught in a kind of time warp. At first, that is. When Gustave Eiffel was ready to throw up his unprecedented thousand-foot tower in 1887, he chose a 27-year-old Compagnon carpenter, Eugene Milon, as foreman. Many of Milon's colleagues considered iron beams a betrayal of tradition, but he finally found 40 good men willing to switch from wood to metal, despite the repugnant fact that the iron beams were—*quelle horreur*—prefabricated, requiring none of their proud skill.

Since then they have adjusted. For decades now, Compagnon locksmiths have worked all kinds of metal. Coachbuilders do automobile bodywork. Saddlemakers are happy to stitch upholstery. Boilermakers bang away at sheet metal in myriad ways. Compagnons leaven most of France's big projects, both renovation and innovation. They painstakingly restore the towers of Notre Dame de Paris, chisel artfully at the Arc de Triomphe and the Louvre, and refurbish the romantic winged horses atop the Paris Opera and the vertiginous statue high above Mont-Saint-Michel on the coast of Nor-

Joseph Harriss, who ten years ago wrote about the French Academy, has just immersed himself in the English Channel (SMITHSONIAN, *April 1996*).

In the multi-year tour, a young Compagnon travels the country—or even farther, today—refining his craft.



Jean Wiart refurbished the Statue of Liberty's torch in 1984 and now does fancy metalwork all over America.

mandy. Compagnons also helped bore the new Channel Tunnel, build the Louvre's new transparent entryway pyramid, and shape rocket engines for the Ariane, which is launched in faraway French Guiana.

Today the three compagnon societies that comprise France's craft guilds train young people in nearly a hundred trades, from chocolate makers and photographers to fashioners of false teeth. What they all have in common, besides uncommon command of their trade, is an idea: manual work, the transformation of matter by man's hand, is a noble calling.

Members include world-renowned chef Joel Robuchon, whose Paris restaurant, a three-star gastronomic summit, sports craft guild symbols even on its napkins and menus. Robuchon, also known by his guild name, "Poitevin la Fidelité," started out to take orders as a priest, then shifted from the seminary to culinary pursuits and to that other monkish order, the Compagnons. "I owe them a lot," he says; "they taught me the love of work." They also taught him one of many trades that can pay handsomely if the individual is good enough and backed by a famous organization.

Pierre Deschamps, president of the Ateliers Sainte Catherine, France's leading maker of special-order trucks, semitrailers and other hauling equipment, regards the compagnon's apprenticeship as "*formidable.*" "I hire all the Compagnons I can get," he says. "A dozen of our 100 employees are Compagnon coachbuilders, and we'd have 20 if we could find them." Painted in giant black letters on a big yellow I-beam above the shop floor is a text from French writer Charles Peguy that could be the Compagnons' creed: "Working with your hands teaches you the value of the things of this earth." The text points up the craft guilds' insistence on the dignity of manual labor and its right to equal prestige with white-collar work. The idea is hardly new—in the fifth century B.C. the Greek philosopher Anaxagoras held that "man thinks because he has a hand"—but it gets overlooked in an era when most of us are tapping little plastic buttons to make electrons whirl.

"Anybody who joins the Compagnons just to find a job is on the wrong track," says Laurent Bastard, curator of France's Guild Museum, which sits beside the Loire River in Tours. "Being a Compagnon is about brotherhood and sharing. If the Compagnons thrive today, it's not only because they teach a trade better than anyone else, but because they inculcate a moral reference point that's lacking among most young people."

Grandiose sentiments, and very French. But somehow in keeping with a group that claims such an ancient

pedigree. Yet Compagnons are thriving today, even in a country that has a 12.5 percent unemployment rate—and close to 25 percent among the young.

With some 30,000 Compagnons plying their trades and another 6,000 apprentices learning theirs, "not one of our Compagnons is unemployed," says Jean Champigny, a guild official in Tours. "They're snapped up by employers as fast as we can train them."

One guild, the Association Ouvrière, does an ongoing study of what becomes of their Compagnons after they complete their masterwork. Forty-five percent own their own businesses, 30 percent are shop foremen, 10 percent technicians, 6 percent architects or engineers, 6 percent teachers, 3 percent miscellaneous. Zero percent on the dole.

Their success is all the more remarkable because it depends on training steeped in ritual and organization, basic craft guild methods inherited from the Middle Ages: one-on-one oral transmission of trade secrets from master to apprentice; years spent working under different masters at guild houses in a succession of cities in the four corners of France (known in the trade as the "Tour de France"); and finally the creation of a masterwork, followed (if it is approved) by formal initiation with a secret ritual.

The would-be Compagnon can apply as young as 15. Ordinarily, if he passes a test of general knowledge and manual skill—only about half do—he has to spend a week in a guild house, observing and being observed. "The first thing we look for in a youngster is whether he's motivated, modest, accepts criticism well, and is patient and persistent," says Michel Lamarque, the provost at the federation headquarters in Paris. "If he has the right character, only then do we follow up to see if he's a good worker."

The guilds place new apprentices with cooperative local firms who teach them the rudiments of their trade while paying $600 a month, about half the French minimum wage. Usually after two years, if they're doing well, they set out on the sine qua non of the Compagnon experience: a six-to-eight-year Tour de France.

In a romantic novel about the Compagnons, George

In solemn ritual on Ascension Thursday, a day special to both their trades, Compagnon roofers (blue sashes) and plumbers (beige sashes) form a "chain of alliance" to serenade *la Mère*, the local guild's housemother.

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Sand describes the tour as "a poetic phase, an adventuresome pilgrimage, the artisan's period of errant knighthood." A typical tour starts in Paris, variously follows the valley of the Seine, Soane and Rhône rivers south to the Mediterranean, then up the Atlantic coast to Nantes, then straight east through the Loire Valley. (The guilds now also have houses in Germany, Switzerland, Belgium, the Netherlands and Canada.) Lodging in one of the 147 *maisons* throughout the country at a cost of about $500 a month for room and board, aspirants normally spend six months in each town. A local Compagnon takes the new boy under his wing and supervises his learning new techniques, new jobs, new tools, new materials. Each day after work the candidate grabs a quick dinner, then takes night courses in his trade.

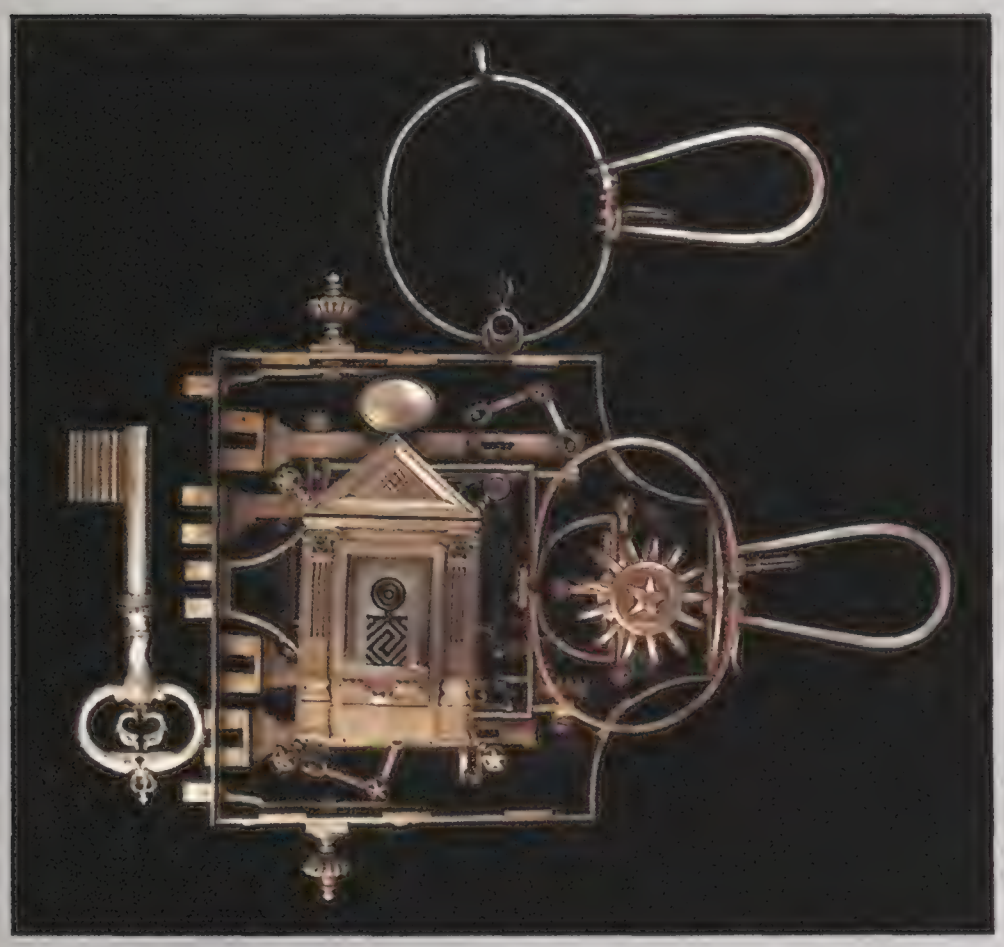
Aspiring Compagnons work at firms like the Ateliers Sainte Catherine that are glad to be part of the program. "The great thing about the oral tradition of learning," says Damien Roussarie, a curly-headed apprentice metalworker at Sainte Catherine, "is that I'm not picking up my trade from textbooks and a shop teacher, but every day from a master."

For a look at the variety of experience the tour gives a Compagnon, consider the itinerary of stonemason Patrick Kalita. After an initial apprenticeship in Marseilles, he went up north to the champagne country where he helped restore Reims cathedral with its famous smiling angel. Heading southwest to Bordeaux, he learned sandblasting techniques while cleaning a series of antique building facades. Again crisscrossing the country, he spent months building stone wine cellars in Strasbourg. Next stop was Paris, for restoration of the Arc de Triomphe, changing stones in the great vault over the Eternal Flame and cleaning grime off the monument's statuesquely turbulent tribute to the Revolution, *La Marseillaise.* Then it was down to Provence to learn fresco work in Avignon, and across the Atlantic for his last stop, Montreal, where he produced his masterwork.

Kalita is a freelance mason now, doing everything from chateau restoration to a hand-sculpted stone model of a Ferrari (p. 100) for a Paris auto showroom, but he still glows when recalling his tour. "Where else but with the Compagnons," he asks, "could I have traveled like that, got that much experience, met that many good people and learned how the world works?"

Where, indeed? On the other hand, in their dedica-

Objects in Compagnon museum include craftsman's hands (right) and masterworks by other artisans.



Locksmith's nightmare, built in 1860, has a tiny pistol (in top circle) set to fire at potential intruders.

Wheel, with clock at center, challenged builder by having 504 spokes, all carved from one piece of wood.

tion to their craft, these young apprentices voluntarily forgo some understanding of "how the world works." According to medieval tradition, Compagnons are supposed to stay celibate during the Tour de France, and compagnon guilds remain closed to women. François Icher, a French writer who has studied the Compagnons at length, calls the craft guilds "a school, a family, and an ethic articulated around the practice of a manual trade." Professional male bonding born of shared professional skill and living together in a succession of guild houses is an essential part of the experience.

Having girls around is regarded as a distraction. If there were females in the group, as Icher rather obliquely puts it, "Free time traditionally devoted to research and personal work would be used differently." Stephane Pouessel, the young provost of a guild house in Tours, prefers to take the long view. "It's true that we don't admit women," he says, "but then women have really only been in the work force for about 50 years, haven't they? We go back 2,000 years. There's still time."

There is one woman, however, who definitely is part of craft guild life, the local guild housemother, *la Mère.* Every guild house has one, often the wife of an established Compagnon, who makes sure the house is in good order, and the meals are well prepared. She also sees that the young apprentices toe the line according to The Rule. Posted prominently in the dining room and read aloud to every new arrival, The Rule prohibits "reading at table, using gross expressions, criticizing those absent, starting quarrels or engaging in loud discussions, staining the table or floor, wasting bread or any other food." Any apprentice caught violating The Rule pays a fine on the spot. "We never have much trouble with our boys," says Marie-Claude Bardolo, Mère at a Paris maison. "They're pretty tired from working all day and then taking courses for two hours after dinner. I love to watch them bloom as they start mastering their trade."

"Devilishly difficult" spiral staircase (8 inches high), has an inside section that can be slid in and out.

A 700-hour masterpiece wins jury approval

The final hurdle before initiation is the *chef d'oeuvre,* the craftsman's PhD "dissertation," which is presented to a jury of veteran Compagnons. In creating a masterpiece, candidates don't strain for esthetic effect. Instead they pile on intricacies of structure and design, making the project as demanding as possible. Case in point: the masterwork of a young metalworker, Frédéric Signoud, who did his at the Ateliers Saint Jacques, a shop 25 miles south of Paris. Signoud kept a diary of his project, complete with photographs, detailing every step in its making. The deceptively simple-looking sculptural object is in the form of an omega about six feet tall (p. 106). But the omega is also a subtly stylized anvil. "I discussed ideas with my Compagnon tutors for three months," Signoud explains, "before I got the green light for something they found difficult enough."

Though you can't tell by looking, the ring is actually hollow, involving an intricately welded inner shell. This meant Signoud had to shape the rectangular portion with four flat faces joined by internal ribs, while he formed the round part by stamping semicircular sections and joining them to make a tube. "When I started, I expected to spend about 350 to 400 hours on it," he says. "But in the end it took 700 hours, all in my spare time. It was worth it, though, because the jury decided it made me a full-fledged Compagnon."

"The guiding principle behind the masterwork is to show that the candidate knows his trade inside out," explains Laurent Bastard. We are exploring the museum in Tours, which holds a collection of masterworks from all sorts of trades. Stopping at a showcase containing a bijou of a miniature staircase (at left) by one Agricol Perdiguier, a 19th-century joiner and guild hero who became a member of Parliament, he directs my attention to its underside. "You can slide the curving bottom piece out. There's no reason for that except to show he could do something so devilishly difficult."

He points out other staircases that swirl up in a paean

Metalworker Frédéric Signoud's fancy aluminum omega took 700 hours to build but made him a Compagnon.

to a perfectly solved equation, the angle of curve changing constantly as when—a favorite Compagnon stunt—the stairs are built around the curve of a wine bottle. Treads fan out from curving stringers, their width changing minutely with each step. Carpenters' masterworks, twisting and turning beyond the mathematical ken of most of us mortals, are mazes of joists and rafters reaching upward to the culminating spire or finial.

In the locksmiths' section we pause before a whimsically complex masterwork (p. 104). Hidden behind a steel door, the lock's secret keyhole can be opened only by simultaneously moving three different elements. Once the safety is set, any false move sets off a Rube Goldbergian chain of events to thwart the thief: the bolt touches a trigger that releases a tiny steel boot that kicks a firing pin and shoots a round from a minute pistol barrel. The slightest additional movement of the lock's handle sets off a steel trap that grabs the thief's hand.

No doubt Emile Ottia, creator of that lock in 1860, was soon going through the centuries-old initiation rite at his local maison. But little is known of the secret ritual, even among Compagnons themselves; it varies not only from one guild to another, but from one trade to another, so that a stonemason doesn't know what goes on at the initiation of a baker or a carpenter.

The mystery surrounding their initiation rites used to cause trouble for Les Compagnons. In 1539 François I, fearing a cabal, the growing power and secret ceremonies of Les Compagnons, banned "all brotherhoods of craftsmen in the Realm." In 1655 the Sorbonne's Theological Faculty condemned alleged "impious, sacrilegious and superstitious practices" in Compagnon initiations. The liberal freethinkers of the French Revolution were just as repressive: one of the new republican government's first acts in 1791 was to ban Les Compagnons. So much for *liberté, égalité, fraternité.*

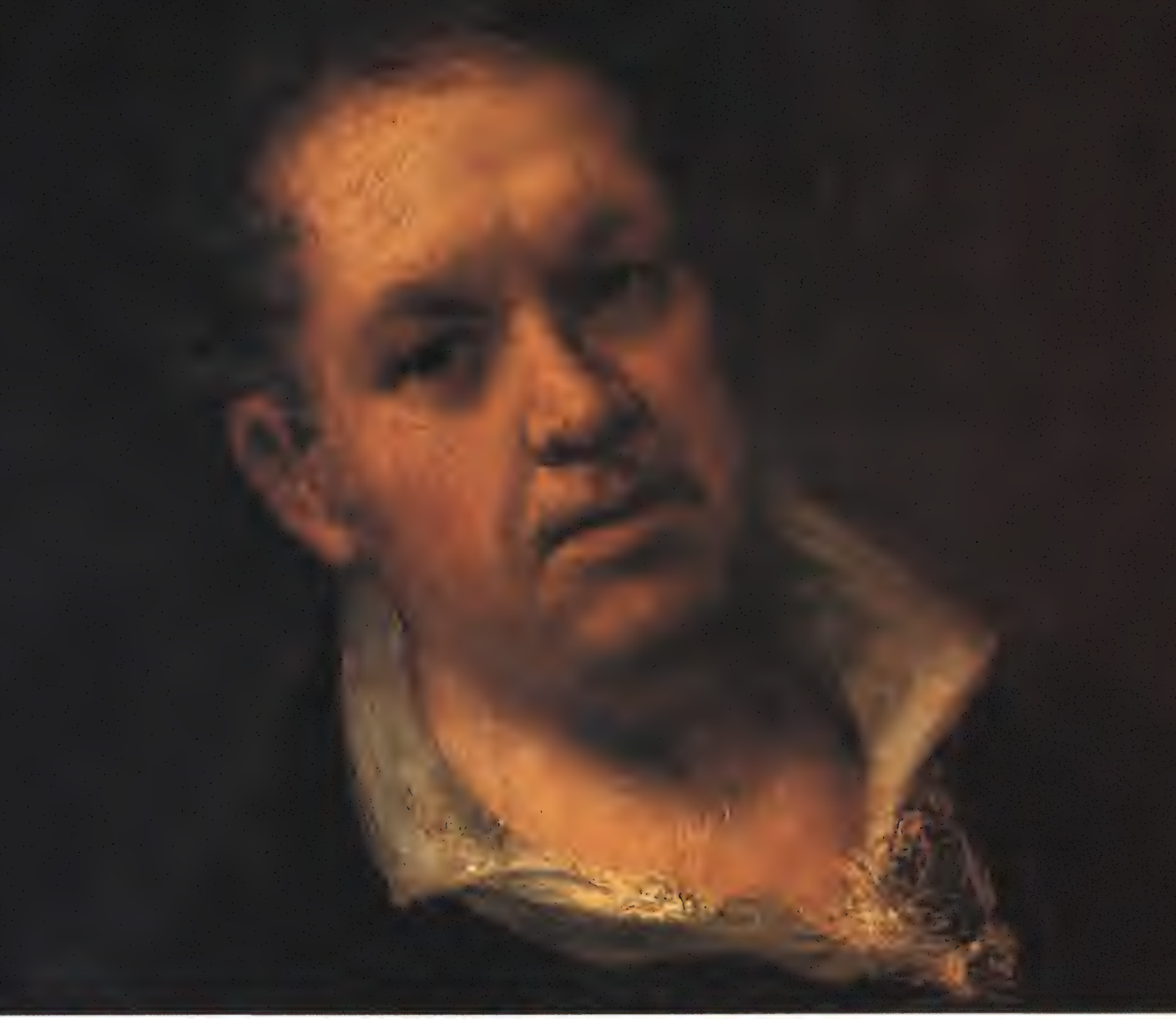
Praising the "Great Architect of the Universe"

By all accounts, anyone looking for "impious, sacrilegious and superstitious" goings-on in today's guilds would be disappointed. Now the initiation amounts mostly to verbal consciousness-raising, a sort of secular baptism in which the candidate receives a new ceremonial name, usually combining hometown and dominant characteristic ("Provençal le Résolu"). He also receives a cane and a colored ribbon or sash corresponding to his trade. Some scholars link it to Masonic rites—French guilds and Freemasons share the compass-and-square symbol, and both refer to God as the "Great Architect of the Universe"—but Les Compagnons reject any close historical connection to Freemasons.

The pride of every Compagnon is his bulrush cane with an ornamental pommel of horn, ivory, silver or wood engraved with trade emblems, his name and date of receipt. At home he'll hang it on a wall in a place of honor; at weddings he and his peers will hoist their canes to form a vault above bride and groom. At death he'll have it beside him in his coffin.

He'll break it out, too, to celebrate the guild's frequent feast days. Each trade has its patron saint, and many trade-saint pairings bear a touch of naive whimsy: Saint Joseph for carpenters, Saint Catherine for coachbuilders (she was martyred on a wheel). As for roofers, the big day is—*naturellement*—Ascension Thursday. Bakers fete Saint Honoré, which also happens to be the name of a popular French cream pastry.

When I looked in on a maison in Paris where Compagnon bakers were honoring their saint, everyone was in full cry. Traditional guild songs, often melancholy with the kind of nostalgia for the Tour de France that some grads feel for good old Yale, resounded off the coffered chestnut refectory ceiling. Golden loaves laden with wheaty garlands stood on tables, including one four feet high in the hexagonal shape of France. All in jacket and tie, not a glazed eye, slack jaw or long lock of hair among them, the young Compagnons were the most squared-away bunch you could find this side of



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Camp Lejeune. The singing went on until midnight, when they joined hands and formed a ring around the Mère before turning in.

Medieval manuscripts refer to the Compagnons. When France's wily King Louis IX drew up statutes for the trades in 1270, he forbade workers generally to leave their masters without permission. Compagnon masons were the only exception: they alone had the right to travel from one worksite to another and cockily wore a gold earring as sign of their free status. During the crusades they joined the Knights Templars as a sort of corps of engineers to build fortresses and Christian churches; the oldest known image of the Compagnons, in a Renaissance manuscript in Paris' Bibliothèque Nationale, shows them being received with pomp during the Muslim siege of Rhodes in 1480.

They would have been well received indeed, for they alone possessed the esoteric construction know-how taught them by Cistercian monks. It was only plane and solid geometry, but at the time it amounted to a powerful trade secret. Compagnons handed it on orally from master to apprentice to make sure it stayed that way. That explains why, even today, Compagnons are such a discreet bunch. They discuss their activities only up to a point, then politely decline to go further.

For centuries French craft guilds were France's only form of organized labor. By the early 19th century they had such a hammerlock on the labor market that they could shut down a recalcitrant employer just by banning work there—no worker dared scab against the Compagnons. It took massive industrialization, with its machines and an urban proletariat indifferent to craftsmanship, to thoroughly undermine the Compagnons. By 1940 craft guild membership, up to 200,000 in the mid-19th century, had fallen to less than 5,000. Since World War II, in an age of increasing technology, Les Compagnons have made an astonishing comeback. One reason, as Paris' heavyweight daily *Le Monde* recently noted, is that "young people with university degrees are having real difficulty entering the job market." Craft guilds "increasingly appear as the guarantee of high-quality training, a virtual passport to the future."

Increasingly, too, France's guilds are opening to the outside world. Though they have not yet taken in women, they are beginning exchange programs with craftsmen from other European countries. The French government has also asked them to look into setting up training programs in Eastern Europe to help artisans there regain the skills their grandfathers knew before Communist rule. They've even been asked to set up a chapter in the United States. "The problem is," says a guild official at a maison in Tours, "Americans tend to see manual work as just a dull job to make a living."

Compagnons lately have been showing up, Superman-like, to help America save its national heritage. At the request of the Historic Charleston Foundation, a handful of them flew to South Carolina in August 1990 to help repair the damage wreaked by Hurricane Hugo, putting new roofs on stately homes and restoring damaged antique furniture. Before that, ten Compagnon metalworkers set up shop at the foot of the Statue of Liberty in 1984 to rebuild the torch, so corroded by decades of leakage it was in danger of falling off.

One of the toughest jobs of Liberty's $40 million restoration, the repairing of the torch was made harder because all the original drawings for the flame were lost (SMITHSONIAN, June 1986). To arrive at a working maquette of its complex geometry, the Compagnons used an age-old device called a measuring frame to plot the flame in three dimensions. Then they fabricated steel molds over the maquette and hammered 23 copper sheets into shape with wooden mallets, repeatedly annealing each to keep it malleable. The final touch was 5,000 squares of gold leaf applied by a specialist father-and-son team from Paris, Robert and Fabrice Gohard.

After finishing that job, half a dozen of the Compagnons decided to stay on and, with Jean Wiart, create the LMC Corporation. They're glad they did, and so are their customers. As a pleased member of the New York architectural firm Swanke Hayden Connell wrote to Wiart, "You have set a precedent for specialized metalwork not seen in this country for many years . . . and set a standard which other metal craftsmen should follow."

American craftsmen take note. But to meet that standard it would help to have about 1,800 more years of tradition under your belt. Plus a few spent doing a Tour d'Amérique. And forget about girls.

Bending to delicate work, a Compagnon repairs wing of archangel who stands guard atop Mont-Saint-Michel.

Dennis M. Knobloch

St. John's United Church of Christ (left), 12 feet deep in water in 1993, had to be abandoned entirely.

By Bruce Watson

A town makes history by rising to new heights

The people of Valmeyer, Illinois, awash in water three years ago, have built a whole new hometown, this time above the flood line

A few weeks after the Mississippi River drowned Valmeyer, Illinois, the town's entire population jammed into a community hall in nearby Columbia. Outside the hall, headlights of latecomers lit the parking lot. Inside, old friends shared coffee and rumors. The town where most of them had lived all their lives lay in the floodplain a few miles away, as lifeless as a model train set. With homes gutted and the community scattered to emergency trailers and shelters, a flock of weary neighbors had come to ask, What now?

As they jostled for seats, Darrell and Anna Glaenzer sheltered their own private questions. More than a month had passed since the couple loaded their children into the car and fled the coming deluge. A couple of days after the Glaenzers abandoned their place, the

Mayor Dennis Knobloch, Valmeyer's civic spark plug, gets moral support from an optimistic sign in 1994, shortly after work began on the new townsite. Behind him a surveyor measures ground elevations.

Mississippi rolled in, surging through downtown, pouring over porches, in some cases rising to rooftops. When the water rolled back, it left rotting walls and a moldy stench of raw sewage and fish. "We still thought, with the flood insurance, we could fix up that house and start again," Darrell recalls. "Then the town board passed out this paper with questions on it. I thought it was ludicrous at the time. Moving the entire town was the furthest thing from my mind."

Valmeyer (pop. 900), 30 miles south of St. Louis, was one of many towns drowned by the Mississippi in the summer of 1993. After the floods, the costliest in American history, some towns cleaned up, others split up. But Valmeyer has been making history by moving up. Taking advantage of a recent federal program in "hazard mitigation," a new Valmeyer has risen out of a 500-acre cornfield and woodland on a bluff just above the ruins of the old town. Citizens gathered the will and wherewithal to build a whole new town from scratch: hundreds of houses, a downtown, churches, a school, a fire station and a post office. The new Valmeyer won't be quite finished until late this year. But after two cramped winters in a trailer city provided by FEMA (the Federal Emergency Management Administration), all but a few residents have moved in, staking their claims on porches fronting freshly seeded lawns.

Before the deluge, Valmeyer wasn't much different from any other small farmland town beside a two-lane blacktop. "It was the kind of town," handyman Mike Mueller says, "where you can be 40 years old but every-

Photographs by Mark S. Wexler

Anna and Darrell Glaenzer, son Josh, daughter Cari, dog Buster, gathered on collapsed carport of old home before it was torn down.

one still sees you as your dad's son." Says Anna Glaenzer, "Our son would say, 'Mom, I want to go to a friend's,' and I'd say, 'Be home by dark,' and I didn't worry. That meant a lot."

Flood years—1910, '43, '44, '47—were part of the town's lore, and residents shared the fatalism commonly found in harm's way. Many trusted the federal levee system, which had kept Valmeyer dry since the last flood. Darrell Glaenzer trusted his father. "My dad told me a long time ago there'd be another flood," Darrell says. "He said he might not live to see it, but if that levee broke we'd have water up to the ceiling. He died on July 9. Heart attack. That was the day after we began sandbagging."

For three weeks the TV news told townspeople that levees were being breached upriver, but Valmeyer stayed put. "You felt as soon as you moved out, you'd be giving up," Darrell recalls. "If you gave up, it would happen." On July 16, a week after doubling their flood insurance to $20,000, the Glaenzers moved baby books, jewelry and their marriage license into their car but went on sleeping in their house. On July 31, everyone was ordered out; the river was on its way.

The main channel of the Mississippi usually stays a good four miles from the town's old site. This time the flood put Valmeyer under as much as 20 feet of water, a brown lake that stretched for miles. The water hung on in many places for two months. Then, in early September, as residents were digging out, it started to rain again. The river poured through the broken levee and flooded the place a second time. The first flood broke some hearts; the second broke spirits.

Suddenly crammed into emergency trailers, families put their belongings in storage and their lives in limbo. "There we were living the quote unquote American dream," Glaenzer says. "Both working, paying the mortgage, two kids in school. And like that, we're homeless. We'd wake up in the middle of the night and wonder, What's going to happen to us?" In their first few weeks adrift, the Glaenzers returned to Valmeyer several times, remembering and grieving. "We'd go home and just sit on the porch," Anna Glaenzer recalls. "We always found something left behind, a toy or some junk to take back to the trailer. We couldn't just leave it lying there." It was not until the first town meeting in Columbia that the Glaenzers heard the term "hazard mitigation," bureaucratese for "keeping the hell out of nature's way."

Time was when FEMA would simply have paid to rebuild Valmeyer in the floodplain. But in 1988 the government at last got tired of throwing away taxpayers' money that way. It made plans to move people out of the path of "recurring natural disasters." Valmeyer, with 90 percent of its buildings ravaged, easily qualified for the new program. At the town meeting, residents learned the future according to FEMA. Anyone was welcome to rebuild in the old town, provided he used his own money and ran his own risks. But under the new laws, the town wouldn't receive a dime of government funds to rise again in the river's path—unless it chose to "elevate" all new structures above the latest flood level. Angry, confused, still numb from the nightmare, residents were asked whether they wanted to build a new Valmeyer and call it home.

The meeting lasted more than three hours. It took a second meeting the next night to handle everybody. Skeptics surfaced first, warning of endless bureaucracy and a "town" that would be, at best, little more than a subdivision. They'd never be able to build a whole town. Then a dash of pioneer spirit took hold. "Before they came up with the idea of moving, my mind was blank, my heart was just empty," says Jim Harget, a member of Valmeyer's town board. "I wanted to rebuild on our old site, but my wife said, 'Can you promise me a flood will never happen again?' I didn't know what to do." Pressed to decide, two-thirds of Val-

Bruce Watson, an Illinois native, made three trips to Valmeyer for this article. He wrote most recently on Robert Moses (February 1996 issue).

meyer backed relocation. Still doubtful, the Glaenzers voted for it, too. Town officials promised to get moving. Then the Glaenzers went "home" to the trailer city that everyone called "FEMAville" to debate the matter all over again.

"Maybe we could borrow the money to rebuild," Anna suggested. "Sure, if we want to kiss the kids' college goodbye," Darrell responded. "We only got 15 grand in equity down there. So we borrow 30 grand and rebuild. Then maybe get flooded again? My dad had it right."

They looked at real estate in neighboring towns, but with 50,000 houses flooded, some places once worth $75,000 were going for as much as $90,000. Even apartments were scarce, with rents rising like floodwaters. A new Valmeyer began to seem like their only chance for a home.

And bit by bit, townspeople learned how exacting a task they had taken on. This was not only a first for them. It was an enormous challenge for FEMA. The agency had helped to relocate other towns, but nothing on the scale of Valmeyer. Finance and construction involved 22 government agencies; costs were in the range of $28 million. Residents had to be warned that the project might take seven years. If it took that long, the Glaenzers figured, daughter Cari would have finished col-

Late 1994 aerial shows some street sites and a few buildings. Roofs of the old town are just visible beyond the hill at center.

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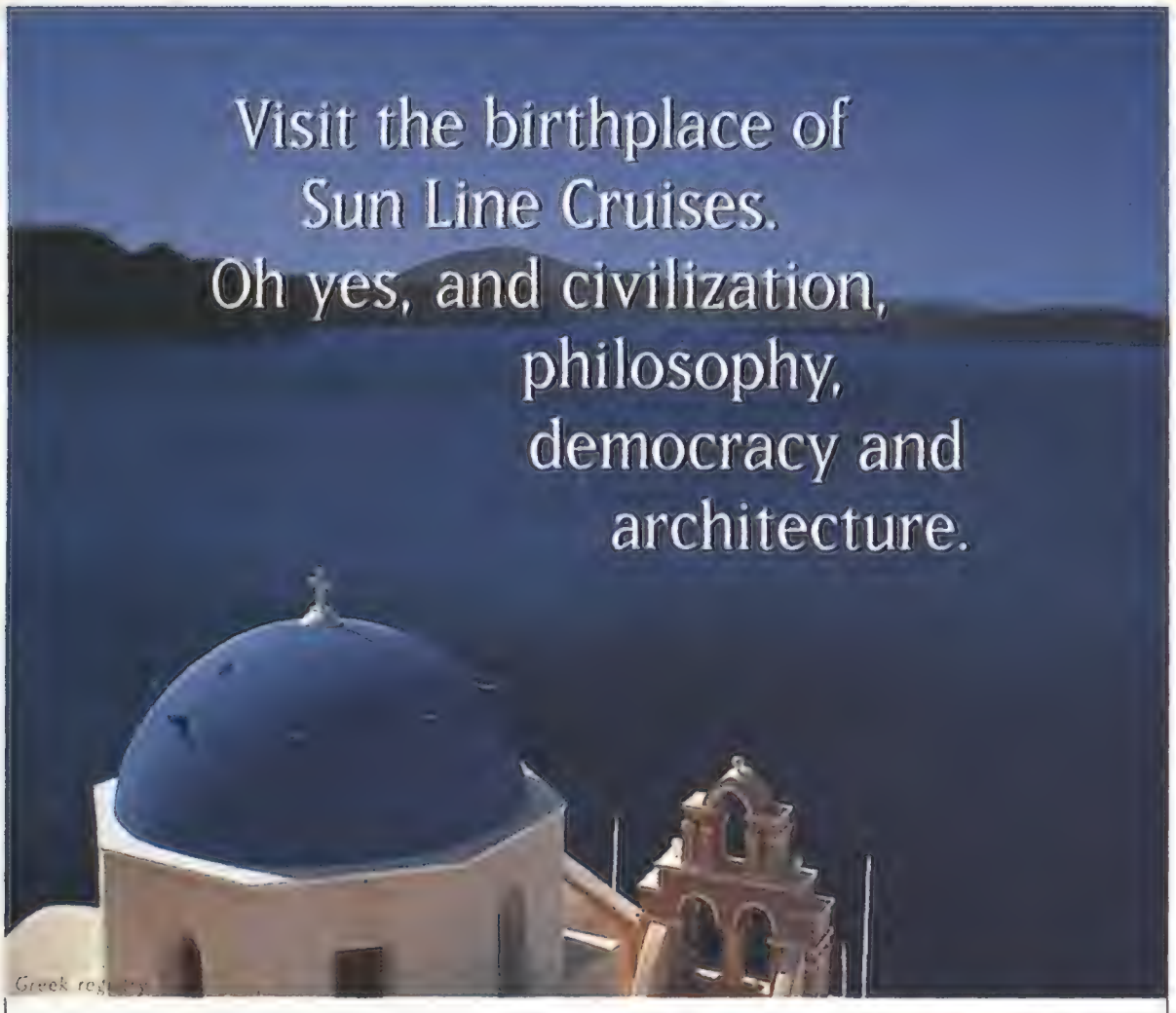

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lege and 8-year-old son Josh would be in high school. Many residents did buy homes nearby, but 200 families hung on to the idea that a new Valmeyer was worth waiting and working for.

Town leaders convinced a retired farmer to sell them a cornfield on the bluffs just above their wreckage. By December of that first fall, billboards on the empty cornfield announced "Valmeyer IL—A New Beginning." Renting a soda machine and some outhouses, the town opened its new Village Hall, a trailer just a dusty drive off Route 156 in the afternoon shadow of a water tower. Each week as winter winds rattled the Village Hall, seven committees of town residents met to plan a town. It proved a little like playing God, but without the hubris. Farmers found themselves plowing through state and federal building codes. Bank tellers and businessmen mastered blueprints. Secretaries and schoolteachers decided details from sewers to streetlamps.

"Ordinances," recalls Jean Langsdorf, who chaired the town design, parks and commons committee. "We had to read through subdivision ordi-

Marietta Schneider and Lizzie peer from their "FEMAville" trailer.

Mayor Knobloch (in plaid shirt) and other members of the Village Board of Trustees meet to work out the new street names and building sites.

nances, sign control ordinances, soil erosion ordinances . . ." Forced to become urban planners, committee members had to get familiar with infrastructure they'd taken for granted. "Who pays attention to streetlights?" Langsdorf asks. "Suddenly we were all making suggestions on lights, pavement, curb design, you name it. I'd get home after a meeting and wonder, What did we just do? Was it right? What am I doing heading a design committee? I'm an accountant!"

On high school gridirons where the Valmeyer Pirates play their archrivals, the Waterloo Bulldogs, Valmeyer was long belittled as a refuge for "river rats." It was a town in "the bottom," a place of high principles—work and family—but low rents and rough edges. Now, while other flooded towns—Grafton, Illinois, and Rhineland and Pattonsburg, Missouri—were planning relocations through FEMA, the "river rats" began to feel proud about going whole hog for a new life. Valmeyer would rise again, no longer a town at the end of the road, but a community of 1,400 sporting the keyhole cul-de-sacs and golf course lawns of a modern suburb.

"What makes a town, anyway?" Jim Harget asks. "It's not just buildings. It's people. If we'd just sat around and bickered, we wouldn't have gotten anywhere."

On a blustery, subzero day in December, three months after voting to relocate, Valmeyer's families gathered in the cornfield where they hoped they would live someday. Streets had been mapped out by then. They used a lottery to determine the order in which residents picked individual house lots. Huddled together in tractor-drawn haywagons, the new pioneers learned that rebuilding might not take seven years. With luck and good weather, the story went, people might begin moving in by next Christmas. The only thing they really needed was houses, and some 25 local contractors stood ready to work. Each family, using insurance settlements, FEMA's buyout money and savings, had to plan for itself. So that winter, nearly an entire town went shopping.

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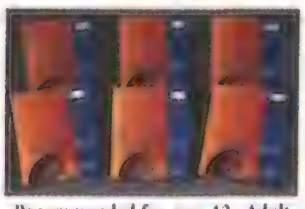

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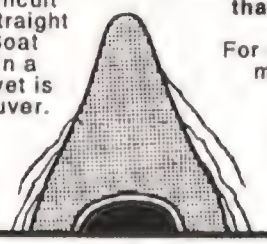

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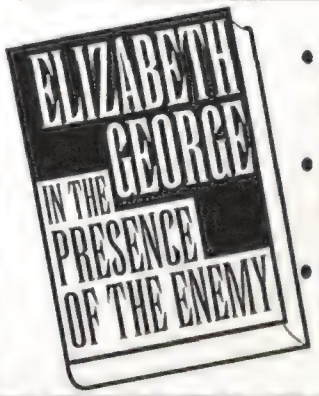

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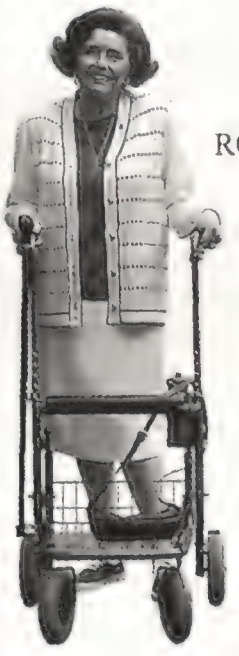

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you'd see someone you knew," remembers Valmeyer policeman Rick Brewer. "People were pushing carts piled with light fixtures, ceiling fans, carpet samples. If anyone got a deal on faucets, they'd tell everyone else. We were all in this together."

"Choosing street names took longer than anything else to decide," Langsdorf recalls. "People get funny about such things. Did we want to bring up the same names from down below? Did we want to honor anybody?" The names chosen reflected a small town's talent for compromise. Empson Street was named after a doctor who delivered almost every baby in town. Other streets edged toward a new suburban flavor—Oak Court, Fox Pointe, Woodland Ridge. Then downtown, where a new Main Street might have been, there was Knobloch Boulevard.

As a street name, "Knobloch" (the *K* is not silent) may lack the panache of "Fox Pointe." But from the bottom to the bluffs, residents agree that without the street's namesake, Valmeyer would still be stuck in the mud. Since the flood, Mayor Dennis Knobloch was the quiet force holding Valmeyer together. A stoic, unflappable Midwesterner known around town as a skilled artist and businessman, he had advanced from teller to CEO of the Farmers State Bank on Main Street. In 1989 he easily won the $70-per-month job as the mayor; he was a few months into his second term when the floods hit. In the town's final hours, he was on the levee, sounding the emergency siren to make sure everyone had left, then giving the go-ahead to turn off the electricity. The clock on Valmeyer's old Village Hall stopped at 1:22 A.M. on August 2. As the waters rose, Knobloch stood with others in the cemetery on a small rise below the bluffs, close enough to hear the water rushing in.

"People were crying and hugging," Knobloch recalls. "We had worked around the clock for three weeks to prevent this, then had it go right through our fingers." Following the flood, while his wife, Elaine, and their three children tended the family's antique store in nearby Maeystown, Knobloch took up residence in his 1988 Chevy pickup, parked at the edge of Valmeyer. With a cellular phone and no shortage of grit, he began weaving the consensus to make a town grow from a bushel of promises. "I've never seen anyone work as hard to help a

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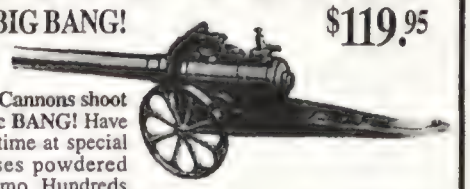

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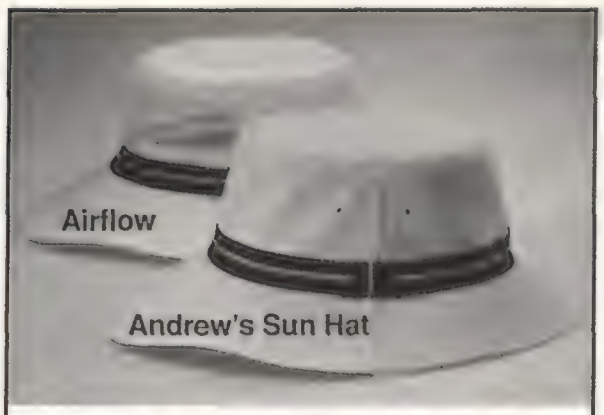
James Early, one of few not to move, fixed his house at his own expense.

community," says FEMA director James Lee Witt.

A year after the decision to relocate, Knobloch drove me in his pickup through an empty field, seeing a town where others saw only dirt and sky. Pointing to a stretch of clods and cornhusks, he said, "This is the light industrial area. The school is over there." In the new Valmeyer, that kind of foresight was important enough to have its own local acronym, VISIONS—Valmeyer Integrating Sustainably Into Our New Setting. But even the most acute vision can't see the problems lying fallow in an open field, especially in this age of environmental impact reports and lingering litigation.

That farmer's cornfield had two owners, and when one died six months after the contracts were signed, the title got tangled in probate. After the town actually got possession, federal law required a survey for relics. A team of archaeologists from the University of Illinois at Urbana-Champaign finally salvaged a prehistoric campsite and a village. By then nearly a year had



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passed since the flood. At Valmeyer's annual Fourth of July picnic two years ago, hundreds of residents gathered in the ruined town for softball, a parade past empty buildings on Main Street, and fireworks spelling out "Valmeyer—A New Beginning." On the bluff above not much had been done.

Suddenly, it turned out that an adjacent quarry owned mineral rights under their new land. Before graded streets could be paved, townsfolk found they needed $3.2 million to settle that claim. Knobloch and committees began piecing together loans and bonds while everybody girded themselves to spend a second winter in trailers. "When we first moved into that trailer, it seemed so big," Darrell Glaenzer says. "Six months later, we had stuff piled all over. We couldn't stand to stay in it. When we were out, we kept looking for excuses not to go back."

Though the town was on hold, time and mortgages waited for nobody. As adjacent cornfields were cut and laid low for fall, FEMA officials called Valmeyer families one by one to the village trailer. Beneath a photograph of the old town up to its eaves in water, residents signed papers paying off their past, mortgaging their future. Under "hazard mitigation" guidelines, FEMA paid residents the difference between the market value of their old homes and their insurance. The Glaenzers' place was valued at $40,000. They collected $20,000 in insurance; FEMA paid them the other $20,000. But their old house was a shambles, and all but worthless now, though the Glaenzers had to pay off the full mortgage. This left them with $25,000—barely enough for a down payment on a new house.

Shortly after closing the mortgage deal, Anna Glaenzer had to sign a check in a local store to buy some jeans. The clerk noticed her Valmeyer address. "How nice of the government to buy you all new homes," she sniped. "Excuse me!" Anna shot back. "We're making payments on that new home!"

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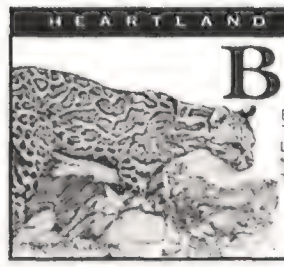

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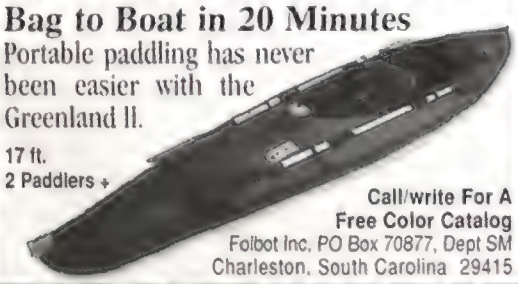

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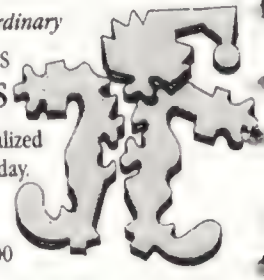

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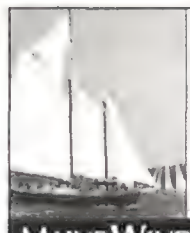

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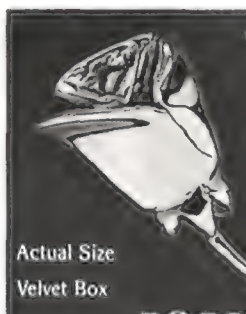

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More than two years after the flood drove them out, the Glaenzers gratefully move their things out of storage and into the new house.

Darrell gently led his wife from the store before she could explain how the Mississippi had washed away not only their house but their savings. Before the flood, they were only 10 years from owning their home. Now they were starting over with a 30-year mortgage. They got a low-interest loan arranged for flood victims, but new homes don't sell for $40,000. Their new payments are nearly double the installments they paid before. "And I was perfectly happy where I was," Anna moaned. "I'd go home in a heartbeat."

But a home, old or new, was a place Valmeyer couldn't seem to find that fall. In December, as they had for decades, they lit the town's star on the bluffs. In FEMAville, Christmas came and went again. Not a single new house had been finished. Rumors of lawsuits and bureaucratic boondoggles made some wish they'd taken the money and run. Anna's brother, tired of waiting, sold his new Valmeyer lot before the house was built.

But late in 1994, with no guarantee that Valmeyer would *ever* be finished, Gordon Anderson bought a trailer and had it installed on his lot within walking distance of Village Hall. All winter, Anderson filled the trailer with furnishings. In April of last year, wading through mud carrying their 6-month-old son, Anderson and his wife, Joan, moved into the new Valmeyer, one of the first families to do so. Within days, the couple planted a dozen trees, tomatoes, and a mailbox out front. Other families soon joined them. "It was kind of fun, like camping out," Anderson remembers. By June 1995, Valmeyer was really changing from blueprint to boomtown.

All through summer, streets were paved a block at a time. Underground utilities went in, homes went up, and moving vans appeared on Fox Pointe and Oak Drive. By last fall, Valmeyer bloomed with the crocuses of suburban life—swingsets, barbecues and bird feeders. The school went up. In hollow shells of churches, volunteer crews from dioceses in other states helped parishioners hammer nails and put up drywall. And on October 1, just two years and two months after they packed their lives in boxes, the

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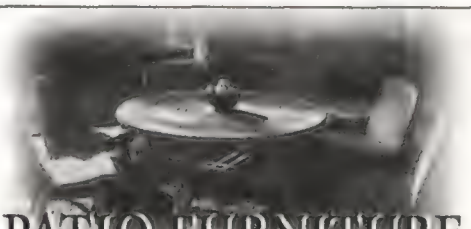

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Glaenzer family finally went home.

"Would you like to come in?" Anna asked me, standing in front of her dusty driveway. "Look, we actually have a place where people can come in and sit." She stepped around unpacked boxes, pointed out the site of a future patio, and beamed. "The day we moved in, I just lay on the sofa and said, 'I'm not getting up again. Please don't move me.'"

The new town looks nothing like the old, of course. Residents are taller than their new trees, and neither cul-de-sacs nor custom homes doth a hometown make. Many still fight tears when recalling the flood. But sitting on his front porch, Jim Harget explains how residents are turning a collection of houses into neighborhoods. "Simple," Harget says. "We're being neighborly." Every evening when the Glaenzers stroll down North Meyer Avenue, a new neighbor calls them in to show off the new house.

Meanwhile, most of Valmeyer in the bottom got torn down as bulldozers razed condemned buildings. Weeks before, its old residents made one last effort to salvage their past. Roaming the ruins, Valmeyer's Social Services Committee removed banisters and ornate trim from old houses and town buildings. These, along with photographs, news clippings, restaurant menus, will be featured in the town's museum, installed in an old log cabin that had been a home on the cornfield. Where a town of 900 once was, only a handful of houses still stand, restored by stubborn owners despite flood danger. The rest, clogged by weeds, flat as an ocean floor, is again what the river made it—a floodplain. "People say we've gotten new houses and everything will be wonderful," says resident Marietta Schneider. "But no matter what happens, the flood has taken something we'll never get back."

Every fall from now on, though, Darrell and Anna Glaenzer will have a rare view from their patio, built with bricks hauled up from his mother's old house. When cold weather strips the trees, they will gaze down on Valmeyer Road winding through the floodplain toward the old town. Then, turning around, they'll see new homes, the tops of new churches and the steady stream of neighbors being neighborly. Says Anna: "It still feels like we're living in somebody else's house, but give it a few years and maybe it'll seem like we've been here forever."

The long ordeal of rebuilding draws to a close on West Woodland Ridge where grass already adorns neighborhood lawns at left, but awaits planting, right.

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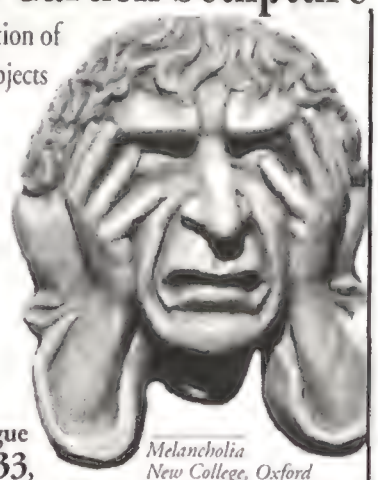
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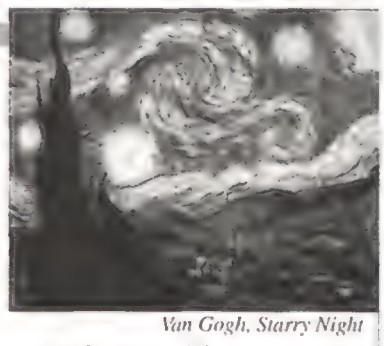
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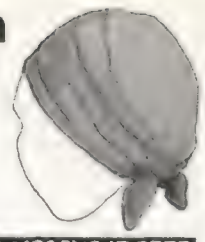
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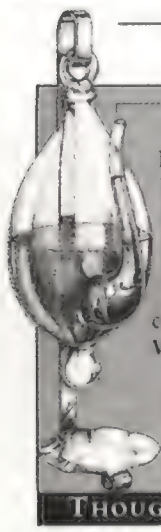

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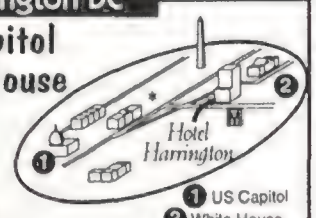

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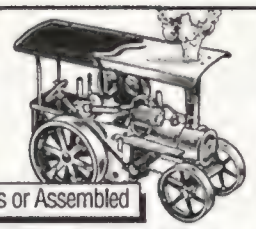

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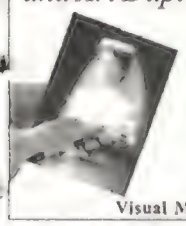

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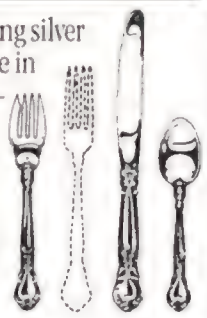

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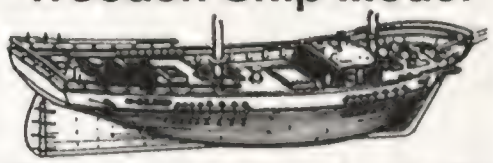

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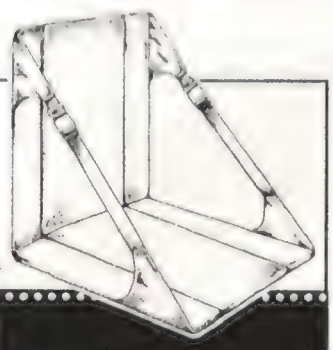

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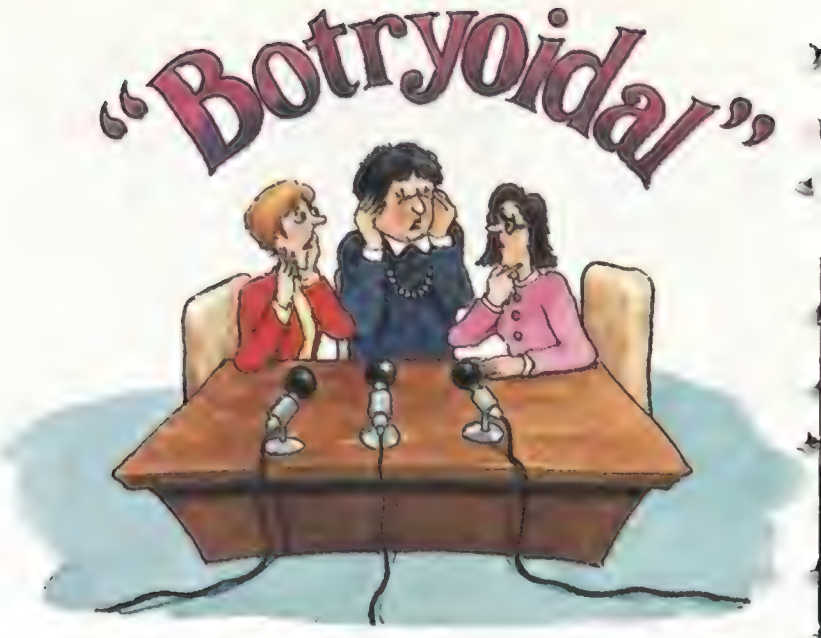
By Edith Pearlman

We may be temerarious and unsuasible, but can we orthographize?



My town holds an annual spelling bee for adults. A gleeful audience pays cash to watch the hapless contestants shoehorn an extra *e* into "eleemosynary" and mix up the consonants in "fuchsia"; the money goes straight to the schools. More than 40 teams of three compete in preliminaries, semifinals and a final, all in one night.

Several weeks before the contest, the players receive a notification that costumes are permitted, together with a list of 3,000 words, any of which they may be required to spell. The words are separated into 20 categories. Architecture. Shapes. Weaponry. Each category includes a few straightforward words, many difficult ones and at least a dozen impossibilities. Horses, for instance, offers "cheekpiece"; also "apishamore"; also "encolure" and "piaffe."

The three women on my team live on the same street, have reached a certain age and are unsuasible and temerarious. Lise is a city planning consultant; she works in a little freestanding office in her yard, a miniature alcazar surrounded by whorlywort. Sasha is a dentist, with large cairngorm eyes. I am Edith, who composes essays on a typewriter and spell-checks with a dictionary: an atavist though no avatar.

When we received the word list, we considered dividing up the categories on the basis of our professions and training. But after a horrified glance at Elements, Sasha announced that too many of them—"molybdenum" and "ytterbium," for instance—had been slipped into the periodic table when she wasn't looking and were probably hoaxes. Lise reviewed Shapes and felt not altogether comfortable with "urceolate" and "botryoidal," and positively sick about "botuliform." The Printed Word category terrified *me*: the orthography of "misspelling" was a shocker, and "bibliothecarial" wasn't even in the *American Heritage*, though my fading French suggested that it means a keeper-of-books—librarianish, so to speak.

And so, forgetting expertise, we each took on the whole caboodle. We quizzed each other from the list. At my house we peeked into the *O.E.D.* At Sasha's we pulled stems from her Latin dictionary and scrabbled in her Russian one as well. In Lise's office we drew leaves, honeycombs and rowboats to help us remember "phylliform," "faveolate" and "scaphoid." And we played music on the gramophone—a bagatelle, a berceuse, a scherzo and a sonata, graced with appoggiaturas.

On the night of the contest, we strode off to the high school auditorium practicing the hardest list of all, Nautical Terms. We shouted out "jibboom" and "bathyscaphe" and even "hawsehole," gentlewomen though we are. We were making sure of "ravehook" as we clambered onto the stage for our preliminary bout. "Does 'rhumb' have an *h*?" Sasha whispered. "Think of 'rhomboid,'" said Lise, confusing the issue. "Buttinsky!" I hissed. ". . . *i-n-s-k-y*," she replied.

We took our seats facing the audience at a table for three. There were five such tables, arranged in a shallow crescent. Ours was the middle one. On our far right sat the team from the local hospital, intimidating in their white coats. One member was a petite Asian-American, one a bespectacled African-American and the third a turbaned Pakistani-American who had recently told me my cholesterol was elevated. At the next table giggled three employees of a popular boutique. They wore satin pants and sequined tank tops. To our left, three householders from another part of town perspired in rented academic gowns. The final team was composed of a grinning young man whose 4-year-old whooped encouragement from the audience, his beaming middle-aged father and his ecstatic grandfather. They wore ordinary jackets.

I would like to say that this array of high-spirited competitors, most of them my acquaintances and some of them my friends, made me thrill to the virtues of community. But I just looked daggers at everyone. Lise's smile glittered falsely. Sasha held her head fixedly so as not to jostle the words packed inside. *She* had not smiled in days. "Lobscouse," fired the moderator at the doctors.

Their heads bent together as if over a corpse. The delicate woman spelled the word correctly. "Myrmecophagous," the moderator flung at the threesome in sequins. They remembered the *y* but replaced the *e* with an *i*, alas. Alas? Who was I flimflamming. . . "Prolusory," he said to us.

We fell into a collective panic. In a whispered conference, we invented "prolouserie" (Sasha), "prolusary" (Lise) and "prolucery" (Edith). We opted for Lise's version which, it turned out, was just as wrong as the others.

The academics couldn't agree about "suffrutescent" and went down wrangling. The patriarchs sailed through "gurney." Three teams had now been eliminated. In the second round, the doctors got "bradawl" and the patriarchs "degauss." On the third round, the doctors missed "crocheting" and the patriarchs triumphed with "wirrah," everybody's favorite fish.

Our match was over. All 15 of us, foes no longer, descended from the stage, chattering and in some cases scratching. "This damned gown has some kind of ectoparasite," fussed one of the academics. "Siphonaptera," clarified a sequin. "Fleas," said Sasha, smiling at last.

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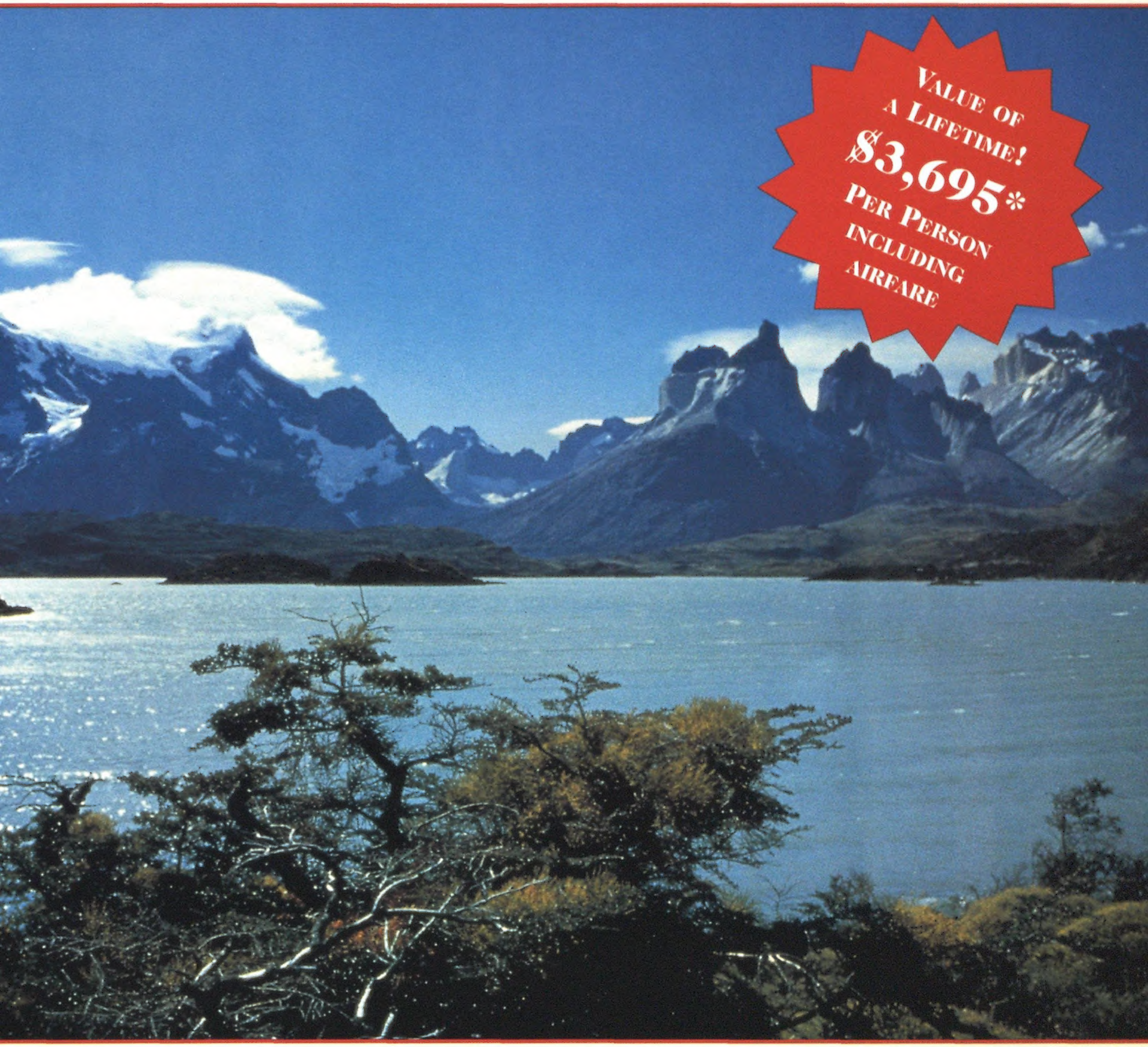

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